

PROJECT MANUAL

CUSTOMIZEABLE
PIONEER

U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2011

SOLAR HOMESTEAD
BLENDSTHELESSONS
OF THE PAST AND
TECHNOLOGIES OF
THE PRESENT TO
CRAFT THE MODEL
HOME OF THE FUTURE.

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VERNACULAR SMART
RECONFIGURABLE DESIGN
INDOOR & OUTDOOR LIVING SPACE
LONG LOCAL IDEALS OF
LASTING SELF RELIANCE AND
INDEPENDENCE
CONNECTED
TO NATURE

THE SOLAR

INDEPENDENCE
& INGENUITY:
THE QUALITIES
EMBODIED IN THE
TRADITIONAL
HOMESTEAD.
INTEGRATING
RENEWABLE
& INNOVATIVE
TECHNOLOGY
INTO A HOME THAT
IS ADAPTABLE &
SELF-SUFFICIENT

HOME STEAD

HEALTHY
SOCIAL AND INTIMATE
NET ZERO
ENERGY
FLEXIBILITY
INDEPENDENCE

APPALACHIAN STATE UNIVERSITY

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01 SUMMARY OF CHANGES

SUMMARY OF CHANGES

Significant changes to the project manual that have occurred between submissions have been outlined below. The Construction Drawings should also be reviewed for relevant revisions.

3.22.2011 REVISION

The Project Manual has been updated from the previous issue. Revisions include:

- Section Format and Page Format requirements have been updated
- The version adheres to PDF bookmarking guidelines and all other formatting requirements
- Format of document has been fixed to meet requirements
- Construction Specifications have been modified to match Construction Documents
- Bookmarks have been added
- Construction Specifications have been included in this submission, and are formatted in accordance with International Building Code MasterFormat.

4.25.2011 REVISION

The Project Manual has been updated from the previous issue. Revisions include:

- Addition of Structural Calculations
- Addition of manufacturer specification sheets
- Sub-bulleted PDF bookmarks

6.30.2011 REVISION

The Project Manual has been updated from the previous issue. Revisions include:

- Addition of manufacturer specification sheets
- Revision of products and the corresponding specification sheets
- Reformatting the manual to create a cohesive package with signage
- Addition of title pages

8.11.2011 REVISION

The Project Manual has been updated from the previous issue. Revisions include:

- Addition of Appendix A: Structural Calculations
- Addition of Appendix B: Manufacturer's Specifications and Cut Sheets



02 RULES COMPLIANCE CHECKLIST

RULES COMPLIANCE CHECKLIST

| RULE | RULE DESCRIPTION | LOCATION DESCRIPTION | LOCATION |
|----------|----------------------------|--|--|
| Rule 4-2 | Construction Equipment | Drawing[s] showing the assembly and disassembly sequences and the movement of heavy machinery on the competition site | O101 to O111 |
| Rule 4-2 | Construction Equipment | Specifications for heavy machinery | PM: 02 43 13.13 |
| Rule 4-3 | Ground Penetration | Drawing[s] showing the locations and depths of all ground penetrations on the competition site | E101 |
| Rule 4-4 | Impact on the Turf | Drawing[s] showing the location, contact area, and soil-bearing pressure of every component resting directly on the turf | S101, S501, C101, C102, C103, L102, & PM: Impact on the Turf |
| Rule 4-5 | Generators | Specifications for generators | PM: 01 51 13 |
| Rule 4-6 | Spill Containment | Drawing[s] showing the locations of all equipment, containers, and pipes that will contain liquids at any point during the event | H101, P103, P101, P102 |
| Rule 4-6 | Spill Containment | Specifications for all equipment, containers, and pipes that will contain fluids at any point during the event | PM: 23 71 00, 22 41 16, 22 41 23, 22 41 39, 22 33 30, 22 13 53, 22 33 13, 22 11 16, 22 12 19, 21 10 00 |
| Rule 4-7 | Lot Conditions | Calculations showing that the structural design remains compliant even if 18 in. [45.7 cm] of vertical elevation change exists | S501 PM: 13 54 19 PM: Structural Calculations |
| Rule 4-7 | Lot Conditions | Drawing[s] showing shimming methods and materials to be used if 18 in. [45.7 cm] of vertical elevation change exists on the lot | S501, S502 |
| Rule 5-2 | Solar Envelope Dimensions | Drawing[s] showing the location of all house and site components relative to the solar envelope | A201 & A202 |
| Rule 5-2 | Solar Envelope Dimensions | List of solar envelope exemption requests accompanied by justifications and drawing references | NOT APPLICABLE |
| Rule 6-1 | Structural Design Approval | List of, or marking on, all drawing and project manual sheets that have been or will be stamped by the qualified, licensed design professional in the stamped structural submission; the stamped submission shall consist entirely of sheets that also appear in the drawings and project manual | PM: Structural Calculations, APPST_DRAWINGS_2011-08-11 |
| Rule 6-2 | Finished Square Footage | Drawing[s] showing all information needed by the rules officials to measure the finished square footage electronically | A-112 |
| Rule 6-2 | Finished Square Footage | Drawing[s] showing all movable components that may increase the finished square footage if operated during contest week | NOT APPLICABLE |

RULES COMPLIANCE CHECKLIST CONTINUED

| RULE | RULE DESCRIPTION | LOCATION DESCRIPTION | LOCATION |
|----------|---------------------------|---|---|
| Rule 6-3 | Entrance and Exit Routes | Drawing[s] showing the accessible public tour route and the ground surface area that will be covered by organizer-provided walkway material | G102, C102 |
| Rule 7-1 | Placement | Drawing[s] showing the location of all vegetation and, if applicable, the movement of vegetation designed as part of an integrated mobile system | L101, C401, C402 |
| Rule 7-2 | Watering Restrictions | Drawing[s] showing the layout and operation of grey water irrigation systems | NOT APPLICABLE |
| Rule 8-1 | PV Technology Limitations | Specifications for photovoltaic components | PM: 26 31 00 |
| Rule 8-3 | Batteries | Drawing[s] showing the location[s] and quantity of all primary and secondary batteries and stand-alone, PV-powered devices | F101 |
| Rule 8-3 | Batteries | Specifications for all primary and secondary batteries and stand-alone, PV-powered devices | PM: 28 31 00 |
| Rule 8-4 | Desiccant Systems | Drawing[s] describing the operation of the desiccant system | NOT APPLICABLE |
| Rule 8-4 | Desiccant Systems | Specifications for desiccant system components | NOT APPLICABLE |
| Rule 8-5 | Village Grid | Completed interconnection application form. | PM: INTERCONNECTION APPLICATION FORM |
| Rule 8-5 | Village Grid | Drawing[s] showing the locations of the photovoltaic, inverter[s], terminal box, meter housing, service equipment, and grounding means | E101, E102 |
| Rule 8-5 | Village Grid | Specifications for the photovoltaic, inverter[s], terminal box, meter housing, service equipment, and grounding means | PM: 26 05 26, PM: 26 05 83, PM: 26 05 33.16, PM: 26 28 13, PM: 26 24 16, PM: 26 27 26, PM: 26 31 00, PM: 48 19 16 |
| Rule 8-5 | Village Grid | One-line electrical diagram | E602 |
| Rule 8-5 | Village Grid | Calculation of service/feeder net computed load per NEC 220 | E604 |
| Rule 8-5 | Village Grid | Site plan showing the house, decks, ramps, tour paths, and terminal box | G102 |
| Rule 9-1 | Container Locations | Drawing[s] showing the location of all liquid containers relative to the finished square footage | P101, P501, H101, C103 |
| Rule 9-1 | Container Locations | Drawing[s] demonstrating that the primary supply water tank[s] is fully shaded from direct solar radiation between 9 a.m. and 5 p.m. EDT or between 8 a.m. and 4 p.m. solar time on October 1 | P111, G601 |
| Rule 9-2 | Team-Provided Liquids | Quantity, specifications, and delivery date[s] of all team-provided liquids for irrigation, thermal mass, hydronic system pressure testing, and thermodynamic system operation | PM: DETAILED WATER BUDGET |

RULES COMPLIANCE CHECKLIST CONTINUED

| RULE | RULE DESCRIPTION | LOCATION DESCRIPTION | LOCATION |
|-------------|-------------------------|--|----------------------|
| Rule 9-3 | Greywater Reuse | Drawing[s] showing the layout and operation of greywater reuse systems | P101, H101, P602 |
| Rule 9-4 | Rainwater Collection | Drawing[s] showing the layout and operation of rainwater collection systems | NOT APPLICABLE |
| Rule 9-6 | Thermal Mass | Drawing[s] showing the locations of liquid-based thermal mass systems | NOT APPLICABLE |
| Rule 9-6 | Thermal Mass | Specifications for components of liquid-based thermal mass systems | PM: 23 71 00 |
| Rule 9-7 | Greywater Heat Recovery | Drawing[s] showing the layout and operation of greywater heat recovery systems | NOT APPLICABLE |
| Rule 9-8 | Water Delivery | Drawing[s] showing the complete sequence of water delivery and distribution events | 0109, 0110, 0111 |
| Rule 9-8 | Water Delivery | Specifications for the containers to which water will be delivered | 0104 PM: 22 12 19 |
| Rule 9-9 | Water Removal | Drawing[s] showing the complete sequence of water consolidation and removal events | 0104 |
| Rule 9-9 | Water Removal | Specifications for the containers from which water will be removed | PM: 22 13 53 |
| Rule 11-4 | Public Exhibit | Interior and exterior plans showing entire accessible tour route | G102 |



03 **STRUCTURAL CALCULATIONS**

STRUCTURAL CALCULATIONS

Refer to Appendix A for Structural Calculations.

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04 **IMPACT ON TURF**

IMPACT ON TURF

The following analysis is an overview of weight, contact area, and soil-bearing pressure of every component resting directly on the turf of the National Mall.

BUILDING COMPONENTS

The Solar Homestead is composed of the 864 square foot main house, six 128 square foot OM trailers, and one 316 square foot Flex OM trailer [120 square foot of which is indoor heated space].

Maximum Building Loads [per square foot of conditioned space]:

- Roof live load = 35 pounds per square foot
- Roof dead load = 15 pounds per square foot
- Floor live load = 40 pounds per square foot
- Floor dead load = 15 pounds per square foot
- Total Loading = 105 pounds per square foot

Bearing Pressures on National Mall:

The main house has 864 square feet of conditioned space with a total load of 90,720 pounds. This load is distributed evenly among eighteen 7,500 pound capacity jacks giving a load per jack of 5,040 pounds. Given a maximum bearing pressure of 1,500 psf that the jack bases can exert on the National Mall lawn the base plate area for each jack was set at 576 square inches [24" by 24"] which results in a bearing pressure of 1,260 pounds per square foot.

The 16,000 pound Flex OM has 120 square feet of conditioned space and approximately 192 square feet of porch space and solar canopy above. The 39,400 pound load is distributed evenly among eight 7,500 pound capacity jacks giving a load per jack of 4,925 pounds. The base plate area for each jack was set at 576 square inches [24" by 24"] which results in a bearing pressure of 1,232 pounds per square foot.

Each of the six 5,800 pound OMs [or canopy modules] has approximately 128 square feet of covered porch area. Given the roof and floor live load the overall weight will be 15,400 pounds. This load will require four 7,500 pound jacks each with base plate areas of 400 square inches [20" by 20"] resulting in a bearing pressure of 1,386 pounds per square foot.

OTHER SITE COMPONENTS

The Solar Homestead site will also contain three bladder tanks mounted on 4 inch by 4 inch timber sleepers and numerous straw bales. The straw bales have a bearing surface of about five square feet and weigh about 50 pounds giving a bearing load of 10 pounds per square foot.

The three water tanks are sized at 1000, 600, and 25 gallons. The 1,000 gallon water supply tank will be housed in a plywood structure and covered with straw bales to prevent solar gain. The total weight of the tank and coverings is estimated at 9,930 pounds. This will require a minimum of six 4.5 foot sleepers to bring the bearing pressure to 1,261 pounds per square foot.

The 600 gallon waste water bladder tank will require a minimum of three 5 foot sleepers to bring the bearing pressure to 1,177 pounds per square foot.

The 25 gallon waste water bladder tank will only have a bearing pressure of 221 pounds per square feet using two 2 foot sleepers.



05 DETAILED WATER BUDGET

DETAILED WATER BUDGET

Team-approved liquids, brought by Appalachian State University:

| Liquid Usage | Quantity | Characteristics | Delivery Date |
|---------------------------------------|-----------|---------------------------------|---------------|
| Irrigation | 35 Gallon | Water used for vegetation | 9/14/11 |
| Thermal Mass | N/A | N/A | N/A |
| Pressure Testing | 15 Gallon | Water used for pressure testing | 9/14/11 |
| Thermodynamic system operation | N/A | N/A | N/A |

Water Consumption and Greywater Production:

| FUNCTION | WATER USE (GALLONS) | WATER USE (LITERS) | CALCULATIONS | | | NOTES |
|---------------------------------|---------------------|--------------------|--------------|--------|--------|--|
| | | | GALLONS | LITERS | EVENTS | |
| Hot Water Draws | 264 | 999.3 | 16.5 | 62.5 | 16 | 10% extra per draw for spillage |
| Water Vaporization | 2.4 | 9.1 | 0.6 | 2.3 | 4 | begin with 6 lb of water |
| Dishwasher | 11.9 | 45.0 | 2.38 | 9.0 | 5 | 2.38 gallons/load per Manufacturer's Specifications |
| Clothes Washer | 80.5 | 304.7 | 10.061 | 38.1 | 8 | 10.06 gallons/load per Manufacturer's Specifications |
| Vegetation | 270 | 1022.1 | 15 | 56.8 | 18 | 15 gallons per day for 18 days between assembly and disassembly |
| Fire Protection | 182 | 688.9 | 182 | 688.9 | 1 | 7 minutes of flow at estimated 13 gpm per head, two heads. Drawn from common supply. |
| Thermal Storage Tanks | 0 | 0 | 0 | 0 | 0 | N/A |
| Testing | 56 | 212.0 | 7 | 26.5 | 8 | 7 gallons per day of assembly |
| Initial Systems Fill | 15 | 56.8 | 15 | 56.8 | 1 | Solar thermal loop: collectors and plumbing. 2x extra for spillage |
| Solar Thermal Collectors | 0 | 0 | 0 | 0 | 0 | N/A (see above) |
| Aesthetic Purpose | 10 | 37.9 | 2.5 | 9.5 | 4 | General cleaning + dinner party cleanup |
| Radiant Flooring | 0 | 0 | 0 | 0 | 0 | N/A |
| Safety Factor | 89.2 | 337.6 | | | | 10 % extra |
| WATER REQUIRED | 981.0 | 3713.4 | | | | |
| Greywater | 467.3 | | | | | Hot water draws, dishwasher, clothes, testing, and safety factor. |



06 SUMMARY OF UNLISTED ELECTRICAL COMPONENTS

SUMMARY OF UNLISTED ELECTRICAL COMPONENTS

All electrical components carry an approved testing agency's listing per Section 6-7 of the SD2011 Building Code.



07 **SUMMARY OF
RECONFIGURABLE
FEATURES**

SUMMARY OF RECONFIGURABLE FEATURES

All reconfigurable features in The Solar Homestead are limited to non-building integrated components, such as furniture and some accessories.



08 INTERCONNECTION APPLICATION FORM

INTERCONNECTION APPLICATION FORM

TEAM APPALACHIAN STATE UNIVERSITY LOT 205

PV SYSTEM

All Sub-Arrays utilize SANYO HIP-195 DA3 photovoltaic panels.

| Array Number | Number of Panels | Number of Parallel Strings | Number of Panels/String | DC Rating of Array | |
|--------------------|------------------|----------------------------|-------------------------------|--------------------|-------------|
| | | | | In series | In parallel |
| Sub-Array 1 | 12 panels | 2 parallel string | 6 panels in series per string | 482 Voc | 15.5 Isc |
| Sub-Array 2 | 12 panels | 2 parallel string | 6 panels in series per string | 482 Voc | 15.5 Isc |
| Sub-Array 3 | 18 panels | 3 parallel string | 6 panels in series per string | 482 Voc | 23.3 Isc |

Total DC power of all arrays: 8.2 kW
 10.5 kW [includes 30% reflected irradiation]

INVERTERS

| Inverter Manufacturer | Model Number | Voltage | Rating [kVA or KW] | Quantity |
|-----------------------|-------------------|---------|--------------------|----------|
| KACO | blueplanet 2502xi | 550 | 2.5 KW | 2 |
| KACO | blueplanet 5002xi | 600 | 5 KW | 1 |

Total AC power of all inverters: 10 kW

1. One-Line Electrical Schematic – E-602
2. Feeder and Service Load Calculations [NEC 220.82] – E-604
3. Feeder Neutral Load Calculations [NEC 220.61] – E-604
4. Plan view of the lot showing: house, decks, ramps, tour paths, the service point and the distribution panel or load center – G-102/E-101



09 ENERGY ANALYSIS RESULTS & DISCUSSION

ENERGY ANALYSIS RESULTS AND DISCUSSION

INTRODUCTION

The energy analysis projects the electrical energy production and consumption of The Solar Homestead during the competition in Washington D.C. The size of the bifacial photovoltaic canopy takes into account seasonal variations of sun position, irradiance, and monthly cloud coverage in Washington, DC as to provide sufficient energy year round. The approximate total energy output of the PV array is calculated using the rated efficiency of the panels and the approximate daily isolation on the array. The energy contributions from the Trombe wall and solar thermal hot water system are underestimated to provide a conservative analysis. Three scenarios were considered in the energy analysis: best, intermediate, and worst, based on temperature and irradiance variations in weather data as well as the effectiveness of the solar thermal system in the Solar Homestead. Historical weather data was used to produce a photovoltaic energy estimation of 285.3 kWh.

HVAC LOADS

The preliminary HVAC model assumed an interior temperature of 73.5°F. Hourly temperature data in Washington, DC from September 2010 was used to predict the outside temperatures during the competition. The floors and walls were given R values of a minimum of 35. The R-5 triple paned glass windows and doors facing North, South, East and West in The Solar Homestead were given additional solar heat gain constants of 15, 28, 60 and 15 BTUs per square foot per hour, respectively. The value for the west glazing accounts for the shading from the Great Porch. Component loads were calculated by using standard thermal transmission calculations and the additional solar heat gains as required and were determined by the hourly weather data. The HVAC was modeled to run during the comfort zone contest times. According to the intermediate model, The Solar Homestead's HVAC system will use approximately 96kWh, while the Flex space will use 18kWh.

HOT WATER DRAWS

The Solar Homestead will employ a solar thermal storage and exchange device which is designed to provide 100% of the water heating energy without consuming electricity. However, an on-demand electric water heater will serve as a backup to the solar thermal system. The hot water competition requires a total of sixteen different 15 gallon water draws, which require a 60 degree Fahrenheit temperature rise from the electric water heater. Assuming a heat capacity of 1 BTU/lb/F and a 10% contingency, the total amount of energy consumed for hot water draws is estimated to be 40 kWh. For the three scenarios considered, "best" is when no backup electricity is needed, "intermediate" is when 50% backup electricity is needed, and "worst" is when 100% backup electricity is needed.

COOKING

The energy analysis includes a detailed energy budget for each of the dinner parties held at The Solar Homestead. The dinner menus include specific cooking instructions. According to these instructions, it is calculated that the 2.0 kW oven will run for a total of 115 minutes for both dinner parties and an extra 10 minutes during the movie night for a total consumption of 4.17 kWh. The oven will also be used in broil mode for a total of 10 minutes. Rated at 3.6 kWh the broiler will consume a total of 0.6 kWh. The stove top consists of four different elements; the 9 inch element, outputting 2.2 kW, will primarily be used. Working for the predicted 114 minutes the stove will consume 4.18 kWh. In addition five pounds of water will be boiled completely to vapor four different times. According to initial testing each boil-off will require 2.55 kWh for a total of 10.2 kWh over the course of the nine day competition. The total consumption of the stove and oven unit is predicted to be 19.15 kWh.

APPLIANCES

The full size refrigerator and freezer will operate nine days of the energy competition at the required temperatures of 36°F and 2°F. The clothes washer and dryer both require eight cycles as part of the contests consuming 0.32 kWh/cycle and 3.65 kWh/cycle, respectively. The dishwasher will operate for five cycles during the competition, consuming 1.34 kWh/cycle. The home electronics including the computer and television are calculated to operate for 35 hours during the competition at 28 W and 150 W, respectively. The movie projector will be used only during movie night; while the home entertainment speakers will be used during both dinner parties and movie night. The total energy consumption of all loads throughout the competition is estimated at 280.35 kWh.

LIGHTING

Lighting for The Solar Homestead was designed with efficiency and ease of use for homeowners, providing a variety of lighting solutions indoors and outdoors. The interior shell of The Solar Homestead is lit by 207 ft. of LED strip lighting along a top and bottom cove. LED cove lighting is the primary ambient light indoors and consumes only 0.95 W/ft. The cove lighting is wired to 3 way dimmer switch, offering flexibility and reducing energy consumption. The interior core of The Solar Homestead is lit with two linear fluorescents recessed into solar thermal skylights, providing the homeowner with natural light during the day and the option for light at night. The fluorescents will consume 30W total. Task and Accent lighting is provided by LED puck lights; thirty-two puck lights are used throughout the interior and consume 3.6W each. The LED puck lights are wired to a dimmer switch, aiding flexibility and efficiency. Linear fluorescent strips are placed throughout the interior for lighting in the closets and bathrooms for the interiors. Fluorescent strips are an inexpensive way to light efficiently. The strips range from 15W-18W depending on the length and diameter.

Exterior Lighting for The Solar Homestead is minimal but provides ambient landscape light and accent lighting for the Solar Canopy. Fluorescent floodlights are placed on top of the OMs to highlight the canopy, as well as provide lighting for the Great Porch in the evening. The fluorescent floodlights consume 26W each, comparable to a 90W halogen floodlight. LED light bars are placed along the ramps to highlight the landscape and signage. The 24" LED light bars consume 3.6W each. Weather resistant LED strips are placed within three columns along the Great Porch to highlight each entrance into the house; these strips consume .95W/ft.

LIGHTING SCHEDULE

The following table includes all lighting used throughout The Solar Homestead:

| FUNCTION | Manufacturer | Model | Quantity (Feet) | LIGHTING | | Total kWh |
|--------------------------|-------------------|-------------|--------------------|----------|------------------|-----------|
| | | | | kW/cycle | Cycles OR Hrs | |
| Interior | | | | | | |
| Bedroom South (top cove) | Super Bright LEDs | NFLS-WW300 | 22 | 0.021 | 29 | 0.606 |
| Bedroom South (btm cove) | Super Bright LEDs | NFLS-WW300 | 16 | 0.015 | 29 | 0.439 |
| Bedroom North (top cove) | Super Bright LEDs | NFLS-WW300 | 22 | 0.021 | 29 | 0.606 |
| Bedroom North (btm cove) | Super Bright LEDs | NFLS-WW300 | 19 | 0.018 | 29 | 0.522 |
| Bedroom Dividing Wall | Elemental LED | EL-DIM3PKKT | 16 | 0.058 | 29 | 1.670 |
| Bedroom South Closet | Sylvania | 21656 | 1 | 0.015 | 29 | 0.435 |
| Bedroom North Closet | Sylvania | 21656 | 1 | 0.015 | 29 | 0.435 |
| Core Hallway (South) | Sylvania | 22405 | 1 | 0.015 | 29 | 0.435 |
| Core Hallway (North) | Sylvania | 21656 | 1 | 0.015 | 29 | 0.435 |
| Core Utility Closet | Sylvania | 21656 | 1 | 0.017 | 29 | 0.493 |
| Core Laundry Closet | Sylvania | 21656 | 1 | 0.017 | 29 | 0.493 |
| Core Shower Skylight | Sylvania | 22062 | 1 | 0.030 | 29 | 0.870 |
| Core Shower | Super Bright LEDs | NFLS-WW300 | 30 | 0.029 | 29 | 0.827 |
| Core Vanity | Sylvania | 20975 | 2 | 0.056 | 29 | 1.624 |
| South Wall (top cove) | Super Bright LEDs | NFLS-WW300 | 23 | 0.022 | 29 | 0.641 |
| South Wall (btm cove) | Super Bright LEDs | NFLS-WW300 | 23 | 0.022 | 29 | 0.641 |
| North Wall (top cove) | Super Bright LEDs | NFLS-WW300 | 23 | 0.022 | 29 | 0.641 |
| North Wall (btm cove) | Super Bright LEDs | NFLS-WW300 | 23 | 0.022 | 29 | 0.641 |

| FUNCTION | Manufacturer | Model | Quantity (Feet) | LIGHTING | | Total kWh |
|----------------------|-------------------|--------------|-----------------|----------|---------------|-----------|
| | | | | kW/cycle | Cycles OR Hrs | |
| West Wall (top cove) | Super Bright LEDs | NFLS-WW300 | 22 | 0.021 | 29 | 0.602 |
| West Wall (btm cove) | Super Bright LEDs | NFLS-WW300 | 13 | 0.012 | 29 | 0.350 |
| Bay Window | Elemental LED | EL-DIM3PKKT | 3 | 0.011 | 29 | 0.313 |
| Kitchen | Elemental LED | EL-DIM3PKKT | 7 | 0.025 | 29 | 0.731 |
| Exterior | | | | | | |
| OM One (trailer 2) | GE | 71776 | 2 | 0.052 | 29 | 1.508 |
| OM Two (trailer 3) | GE | 71776 | 1 | 0.026 | 29 | 0.754 |
| OM Three (trailer 4) | GE | 71776 | 2 | 0.052 | 29 | 1.508 |
| OM Four (trailer 7) | GE | 71776 | 2 | 0.052 | 29 | 1.508 |
| OM Four: Kitchen OM | Elemental LED | EL-DIM3PKKT | 3 | 0.011 | 29 | 0.313 |
| Site Wall (south) | Elemental LED | EL-BRTWPBAR | 6 | 0.022 | 29 | 0.626 |
| Site Wall (north) | Elemental LED | EL-BRTWPBAR | 6 | 0.022 | 29 | 0.626 |
| Columns | LightingEver | 3258-SMD-LED | 15 | 0.072 | 29 | 2.088 |
| Mechanical Closets | GE | 64234 | 6 | 0.108 | 29 | 3.132 |
| Flex OM | | | | | | |
| Bathroom | Elemental LED | EL-BRTWPBAR | 2 | 0.007 | 29 | 0.209 |
| Flex OM Light Wall | Elemental LED | EL-DIM3PKKT | 7 | 0.025 | 29 | 0.731 |
| Total kWh | | | | | | 27 |

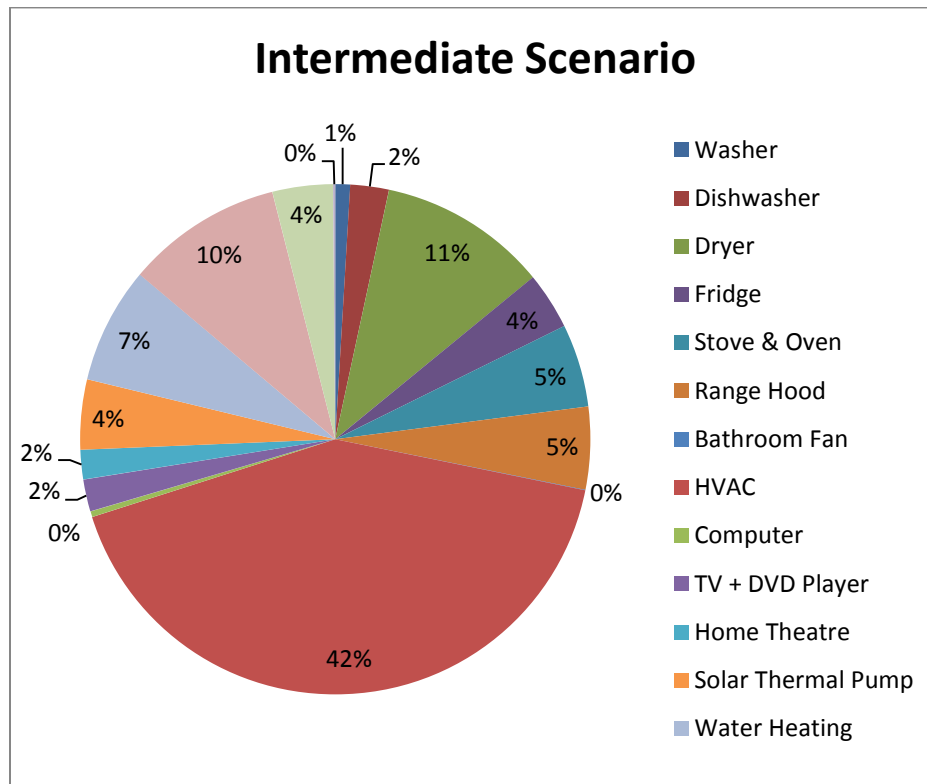
During the entire competition, it was calculated that the lights will consume approximately 27 kWh.

ENERGY BUDGET

The following table includes a competition energy budget of The Solar Homestead's HVAC, hot water draws, lighting, cooking, appliances, and equipment:

| FUNCTION | BRAND | MODEL | | TOTAL ENERGY (KWH) | NOTES |
|-------------------------|------------|-------------------------|-----------------------------|--------------------|--|
| Washer | Bosch | WAE2006UC | 0.319 kWh/cycle x 8 cycles | 2.55 | 8 cycles |
| Dishwasher | Bosch | SHX4AP05UC | 1.3413 kWh/cycle x 5 cycles | 6.71 | 5 cycles for competition + approximately 1 extra for dishwasher rinse |
| Dryer | Bosch | WTE86300US | 3.6505 kWh/cycle x 8 cycles | 29.20 | 8 cycles |
| Fridge | LG | LFC21776ST | 0.04566 kWh/hr x 216 hrs | 9.86 | 9 days, all day |
| Stove Top (boil) | Bosch | NIT3065UC | 2.55 kWh/cycle x 4 cycles | 10.20 | Tested: 2.55 kWh per 5lb evaporation |
| Stove Top (cook) | Bosch | NIT3065UC | Tested | 4.18 | Cooking test energy estimate |
| Oven | Bosch | HBL3350UC | Tested | 4.77 | Cooking test energy estimate |
| Range Hood | Bosch | DKE9605PUC | 620W x 23 hrs | 14.26 | 23 hours assumed for whole house fan function, boiling water, and dinner parties |
| Bathroom Fan | Broan | QTXE-110S | 36W x 3 hrs | 0.11 | 3 hours assumed for whole house fan function |
| HVAC House | Mitsubishi | SEZ-KD09NA & MXZ-2B20NA | | 96.34 | Energy modeling |
| HVAC Flex | LG | LAN095HV & LAU095HV | | 18.03 | Energy modeling |
| Computer | Toshiba | L670 | 28W x 35 events | 0.98 | As required |
| TV | LG | 37LK450 | 150W x 35 events | 5.25 | As required |
| PS3 | Sony | CECH-2501A | 250W x 6.5 hrs | 1.63 | Assumed 3 hrs per movie night + 30 mins for possible jury viewing |

| FUNCTION | BRAND | MODEL | | TOTAL ENERGY (KWH) | NOTES |
|---------------------------|-------------------|------------|-----------------------------|-----------------------|--|
| Projector | Mitsubishi | HC4000 | 260W x 6.5 hrs | 1.69 | Assumed 3 hrs per movie night + 30 mins for possible jury viewing |
| DVD Player | Sony | DVP-SR200P | 9W x 35 events | 0.32 | As required |
| Water Heating | Tempra | 24 | 40.28kWh x 50% backup | 20.14 | Assuming backup heater only needs provide 50% water heating |
| Solar Thermal Pump | WILO | Star 32F | 110W x 110 hrs | 12.10 | 10 hrs a day for 11 days |
| Speaker Bar | Samsung | HW-C540 | 280W x 6.5 hrs | 1.82 | Assumed 3 hrs per movie night + 30 mins for possible jury viewing |
| Lighting | Various | Various | | 27 | See detailed lighting schedule |
| PLC + Controls | Productivity 3000 | Various | 44.04W x 216 hrs | 10.46 | Power dissipation of all PLC components + extra 10% for controls power |
| Main water pump | Grundfos | JPF3 | (1/2HP x 745.7W/1HP) x 1 hr | 0.37 | Assumed 1 hr total of operation |
| TOTAL | | | | 280.35 kWh | |



ENERGY BUDGET RESULTS

The 42 module solar array is rated at 8.2 kW peak. Historical TMY data for Washington, DC predicts a total of 285.3 kWh of photovoltaic electricity will be produced during the system grid-tied period. Therefore, the intermediate consumption scenario is balanced by the photovoltaic electricity produced.



10 CONSTRUCTION SPECIFICATIONS

CONSTRUCTION SPECIFICATIONS

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28 31 00 Fire Detection and Alarm

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DIVISION 48 ELECTRICAL POWER GENERATION

48 19 16 Electrical Power and Generation Inverters

SECTION 01 11 00: SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Project: The Solar Homestead, Appalachian State University 2011 Solar Decathlon
- B. Owner: Appalachian State University
- C. Architect: Appalachian State University Solar Decathlon Team
- D. Project Description: Drawing from traditional Appalachian settlements, The Solar Homestead is composed of multiple buildings which unite to form a self-sufficient ensemble. Six Outbuilding Modules [OM's] interconnect to form the Great Porch, a functional outdoor living space protected by an 8.2kW trellis of bifacial solar cells. The spacious 833 square foot home adjacent to the porch features two bedrooms, a day-lit bathroom, energy-efficient appliances, and a versatile living/dining area. The Solar Homestead also includes an independent 120 square foot Flex-OM, accessible via the Great Porch. This space can transform to become a home office, art studio, or guest quarters.
- E. Mission: The Solar Homestead team is committed to designing, engineering, and constructing an innovative net-zero energy home, powered by solar energy, which is affordable to the average homebuyer. We also strive to encourage future leaders to promote sustainability in the local and global community, through education, outreach, and service, in order to improve the world in which we live.
- F. Goals:
 - 1. To create innovative solar technologies for the developing renewable energy market.
 - 2. To demonstrate how holistic design can blend the aesthetic and technical aspect of solar technologies to be effective, appealing, and flexible to the needs of future residential construction.
 - 3. To educate student participants to communicate to the public about the cost-saving opportunities of solar technologies.
 - 4. To equip students with applicable experiences and unique career training in order to incorporate sustainable practices and renewable energy into the global workforce.

END OF SECTION 01 11 00

SECTION 01 14 00: WORK RESTRICTIONS

PART 1 - ACCESS TO THE SITE

1.1 APPALACHIAN STATE UNIVERSITY SOLAR DECATHLON

- A. Requirements: Only authorized construction personnel, subcontractors, and Appalachian State University Solar Decathlon team members and faculty are allowed on site during construction unless otherwise authorized by the Appalachian State University Solar Decathlon team.
- B. Unauthorized Access: Any persons attempting to access the site without authorization are to be asked to leave in a polite manner. Failure to leave will result in their expulsion [see Criminal Entry].
- C. Criminal Entry: If unauthorized personnel refuse to leave, or if there are visible signs of theft and/or criminal entry, the police shall be notified immediately.

PART 2 - COORDINATION WITH OCCUPANTS

2.1 APPALACHIAN STATE UNIVERSITY SOLAR DECATHLON

- A. Requirements: Appalachian State University Solar Decathlon team members and construction personnel are to comply with any requests made by Appalachian State University. The job site remains the property of Appalachian State University at all times during construction and is to be treated as such.

PART 3 - USE OF SITE

3.1 APPALACHIAN STATE UNIVERSITY SOLAR DECATHLON

- A. Requirements: The site is to be used only for construction of The Solar Homestead and storage of related materials unless otherwise authorized. Construction personnel may not sleep overnight in, dwell within, or otherwise occupy the job site without authorization.
- B. Special Events: The site will be used several times during construction to house special events, which showcase The Solar Homestead. Construction may be halted during these events. Notification will be given by project management as to the date of such events and their impact on construction.

END OF SECTION 01 14 00

SECTION 01 25 13: PRODUCT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all requirements for product substitution for The Solar Homestead.

1.2 GENERAL PRODUCT REQUIREMENTS

- A. Packaging and Labels: Deliver items in original, undamaged, factory packaging with complete manufacturer's labels.
- B. Permanent Labels, Trade Marks, & Trade Names: Locate in inconspicuous locations acceptable to the architect.
- C. VOC Content: Use VOC-free items to the greatest extent possible. When VOC-free is not available or is impractical, use items with lowest VOCs.
- D. Formaldehyde Content: Use formaldehyde-free items to the greatest extent possible. When formaldehyde-free is not available or is impractical, use items with lowest VOCs.
- E. Adhesives: Use nonflammable, water resistant adhesives.
- F. Odors: Use odor-free items to the greatest extent possible. When odor is unavoidable, submit sample and obtain preapproval prior to purchase in quantity.

1.3 SUBSTITUTION REQUIREMENTS

- A. Substitution Conditions: Substitutions are discouraged, except under the following conditions:
 - 1. Specified item is no longer available.
 - 2. Specified item is incorrect, inappropriate, or incompatible.
 - 3. Substitution offers substantial advantage in quality, time, or cost.
 - 4. Submittal is related to an "or equal" clause in specifications.
- B. Substitution Requirements Apply To:
 - 1. Proprietary "named" specification when submitted item is not listed in the specifications.
 - 2. All deviations from contract documents.
- C. Substitution Procedure Requirements:
 - 1. Identify the substitution condition [listed above in "A"].
 - 2. Refer to specification section, article, paragraph numbers, product names, and models.
 - 3. Certify that proposed substitution is coordinated with all related and adjacent work.
 - 4. Provide complete and total cost change information related to the proposed substitution.
- D. Appearance Characteristics: For items visible in the completed work, appearance is an important substitution evaluation factor. The architect will decide if a proposed substitution has acceptable appearance. Proposed substitutions may be rejected for appearance alone.

END OF SECTION 01 25 13

SECTION 01 50 00: TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. *These are temporary facilities and controls that are only used for the purposes of the competition in Washington, D.C. and do not apply to the affordability contest of The Solar Homestead.*
- B. This section includes the temporary facilities and controls that are used for the purposes of the competition in Washington, D.C.

1.2 SECTION REQUIREMENTS

- A. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.

1.3 RELATED SECTIONS

- A. Section 01 51 13 - Temporary Electricity

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Provide tool trailer, storage and fabrication sheds, and other support facilities as necessary for construction operations. Store combustible materials apart from building.
- B. Provide temporary floor cover and allow for solar decathlon organizer-supplied walkway during construction.

2.2 EQUIPMENT

- A. Fire Extinguishers per The Solar Homestead's Health and Safety Plan: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Generator: Refer to Section 01 51 13 - Temporary Electricity

PART 3 - EXECUTION

3.1 GENERAL

- A. Install temporary service or connect to electrical service .
 - 1. Arrange with event organizers for time when service can be interrupted for the period of grid-tie assembly to connect The Solar Homestead to the village grid on day 5 of the competition.
- B. Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
- C. Comply with The Solar Homestead's Health and Safety Plan.

3.2 SUPPORT FACILITIES INSTALLATION

- A. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

- B. Maximum pressure on grass to be less than 1500 PSF for Solar Decathlon competition.
- C. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

3.4 OPERATION, TERMINATION, AND REMOVAL

- A. Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility.

END OF SECTION 01 50 00

SECTION 01 51 13: TEMPORARY ELECTRICITY**PART 1 - GENERAL**

1.1 SUMMARY

- A. *This section includes the temporary electricity that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*

1.2 SYSTEM DESCRIPTION

- A. Supply a mobile generator to be used for power tools and construction lights during standalone assembly and standalone disassembly as well as times permitted by the DOE.
- B. Provide a spill containment pan to be used with the generator.

1.3 SUBMITTALS

- A. Product data, information on decibel levels showing the generator shall meet the National Park Service and psf noise regulation stated in 36CFR2.12
1. Maximum 60 dB at 15 feet under full load.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Honda Power Equipment
4900 Marconi Drive
Alpharetta, GA 30005-8847
Phone: 770-497-6400
www.hondapowerequipment.com
1. Available at national chain hardware stores, such as Lowes.
- B. UltraTech International, Inc
11542 Davis Creek Court
Jacksonville, FL 32256
Phone: 800-764-9563
www.spillcontainment.com
1. Available through UltraTech International, Inc.

2.2 PRODUCTS

- A. Honda Generator Engine GX390
1. Model Number: EU6500IS
 2. Location: Construction Staging Area
 3. Dimensions [L x W x H]: 33.5" x 26.4" x 27.5"
 4. Dry Weight: 260 lbs.
 5. 6500 Watts, 120/240V

6. Receptacles: 20A 125V Duplex, 30A 125V Locking Plug, 30A 125/250V Locking Plug
 7. Noise Level: 60 dB @ rated load or 52 dB @1/4 load at 25 feet
 8. Fuel: 4.5 gallons with 4.7 hours @rated load, 14.0 hours @ 1/4 load
- B. Ultra Tech Containment
1. Model Number: UTI-2351
 2. Dimensions [L x W x H]: 54" x 29-3/4" x 3-1/2"
 3. Weight: 102 lbs.
 4. Containment Capacity: 75 gal

END OF SECTION 01 51 13

SECTION 02 43 13.13: BUILDING RELOCATION**PART 1 - GENERAL****1.1 SUMMARY**

- A. This section includes the methods, equipment and schedules necessary for the transportation of The Solar Homestead from Boone, NC to Washington, DC and back.

1.2 SYSTEM DESCRIPTION

- A. All building components are permanently mounted on custom-built steel trailers of standard sizes.
- B. The 3 House trailers and 1 Flex OM trailer will be pulled by semi-trucks. The DOT has established these vehicle limits: 102 inches wide, 13.5 feet in height, and 80,000 pounds gross weight. These limits can be exceeded as individual states have the right to issue temporary oversize and/or overweight permits.
- C. The 6 OM trailers will be pulled by any standard Medium Duty 3/4 - 1 ton truck.
- D. Design Requirements
 - 1. The Solar Homestead is designed as a group of connectable parts, each of which shall not exceed the allowable dimensions of a flatbed truck, nor shall it exceed the allowable dimensions for highway transportation under federal highway laws. All components shall not exceed 13 ft 6 in height from ground when resting on the bed of the truck[s].
 - 2. The OMs are designed to sit on standard 8' wide trailers, which can legally be pulled by medium duty trucks. All components of the trailer shall not exceed the allowable dimensions for highway transportation under federal highway laws.

1.3 SUBMITTALS

- A. Site Operations and Transportation Plan Solar Decathlon 2011: include trailer specifications, route information, delivery information and site operations.

1.4 PERFORMANCE REQUIREMENTS

- A. The Solar Homestead as a whole must perform identically before and after transportation and re-construction.
- B. The Solar Homestead as a series of parts shall be transported using specified packing and securing methods and no components shall be damaged during transportation.

PART 2 - EXECUTION**2.1 QUALITY ASSURANCE**

- A. Ensure that product is in proper and good working order before accepting the delivery of the product.

2.2 DELIVERY, STORAGE & HANDLING

- A. The exact time of delivery to Washington DC shall be coordinated with the team's and the organizer's schedule.
- B. Additional transportation:
 - 1. Conditioned flower trucks for all plants.
 - 2. Covered trailers for straw bales and the vegetated protected membrane roof materials.
 - 3. Trailer for tools.
 - 4. Moving truck for furnishings

- C. All trailers shall be wrapped with waterproof wrapping to protect the canopy, the decking, and finish surfaces. For the three main house trailers, temporary structure shall be constructed at marriage lines to protect the interior of the trailers.

2.3 INSTALLATION

- A. The Solar Homestead and all of its components shall be disassembled, reassembled, packed, secured, and shipped by designated individuals in accordance with the specified instructions.

END OF SECTION 02 43 13.13

SECTION 05 05 23: METAL FASTENINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes information about structural bolts used to construct The Solar Homestead.

1.2 REFERENCES

- A. ANSI/AWS D 11-92 'Structural Welding Code – Steel.'
- B. ANSI / AWS D1.3-89, 'Structural Welding Code – Sheet Steel.'
- C. ASTM A 36-00, 'Standard Specification for Carbon Structural Steel.'
- D. ASTM A 307-00, 'Standard Specification for Carbon Steel Bolts and Studs 60000 psi Tensile Strength.'

1.3 PRODUCT REQUIREMENTS

- A. Fasteners: "Fasteners" includes nails, screws, bolts, wedge bolts, expansion bolts, chemical bolts, epoxy anchors, pins, power actuated devices, and all other types of mechanical connections.
 1. Completely Specified Fasteners: where fasteners are completely specified in the contract documents, provide the specified fasteners. "Completely specified" means the fastener type, material, finish, size, diameter, length, and spacing are specified.
 2. Fasteners Not Completely Specified: Fasteners may not be completely specified in the contract documents to provide options and allow different means, methods, and techniques of construction. In all cases where the fasteners are not completely specified in the contract documents:
 - a. Select fasteners appropriate for each condition, substrate, load, and exposure.
 - b. Use fastener manufacturer's published load table to determine fastener size and spacing.
 - c. Provide a factor of safety of four or higher.
 - d. Obtain architect's approval of each fastener prior to use.
 - e. Install fasteners in compliance with the fastener manufacturer's recommendations.
 3. Fasteners Related to Assemblies: For construction and assemblies required to be engineered, provide fasteners indicated on the approved, engineered shop drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. 1/2" A307 Bolt [CSI 05 05 23.A1]
 1. Location: OM canopy construction
- B. 3/4" A307 Bolt [CSI 05 05 23.A3]
 1. Location: OM connections
- C. Bolts And Threaded Fasteners
 1. Bolts conform to requirements of ASTM A 307, Grade A.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of bolts shall meet AISC requirements.

END OF SECTION 05 05 23

SECTION 05 12 00: STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all Structural Steel Framing used for The Solar Homestead's solar canopy. For other metal trailers, including the main house trailers and OM trailers, refer to Section 13 34 19 - Metal Building Systems.

1.2 REFERENCES

- A. Comply with applicable provisions of the following:
 - 1. AISC 303
 - 2. AISC 341 and AISC 341s1.
 - 3. AISC 360
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- B. All work shall be in accordance with the AISC Specification.
- C. Contractor shall be responsible for coordinating all erection aides that include, but are not limited to erection angles, lift holes, and other aides.

1.3 RELATED SECTIONS

- A. Section 13 34 19 - Metal Building Systems

1.4 SUBMITTALS

- A. Shop Drawings

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL

- A. Square telescoping columns: 3" x 3" x 3/16" [CSI 05 12 73.L63] outer columns with 2.5" x 2.5" x 3/16" [CSI 05 12 73.L66] inner columns for the Great Porch.
- B. Horizontal beams: 3" x 5" x 3/16" [CSI 05 12 73.L250] for the Great Porch canopy.

2.2 ACCESSORIES

- A. High Strength Bolts, Nuts, and Washers
- B. Anchor Rods
- C. Primer: Fabricator's standard lead-free, rust-inhibiting primer.

2.3 FABRICATION

- A. Canopy: Bid per University of North Carolina System bidding regulations.
- B. Structural Steel: Fabricate and assemble in shop to greatest extent possible according to construction documents.
- C. Weld Connections: Comply with AWS for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- D. Shop Priming: Shop prime steel to a dry film thickness of at least 1.5 mils. Do not prime surfaces to be field welded.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set structural steel accurately in locations and to elevations indicated.
- B. Test telescoping columns and alignment of bolt holes prior to welding assembly to trailers.
- C. All channel structure for OMs at doors to have predrilled holes set in accordance with requirements of door hinges.
- D. High-Strength Bolts: Install high-strength bolts according to manufacturer's recommendations.
- E. Weld Connections: Comply with AWS for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- F. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

END OF SECTION 05 12 00

SECTION 05 52 13: PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes information about the mechanical handrail system used on the ramps and deck of The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Mechanical handrail system comprised of paint steel pipe and welded connections.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Supplied and fabricated by Triplett & Coffey.

2.2 PRODUCTS

- A. 1-1/2" shop-fabricated pipe railings
 - 1. Location: Ramps, landings
 - 2. Steel pipe

2.3 ACCESSORIES

- A. Metal primer and paint

PART 3 - EXECUTION

3.1 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible according to construction documents.
- B. Weld Connections: Comply with AWS for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- C. Shop Priming: Shop prime steel to a dry film thickness of at least 1.5 mils. Do not prime surfaces to be field welded.

3.2 INSTALLATION

- A. Weld Connections: Comply with AWS for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- B. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

END OF SECTION 05 52 13

SECTION 06 05 23: WOOD, PLASTIC, AND COMPOSITE FASTENINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes information about The Solar Homestead's foundation pad fasteners for decks, ramps and site walls.

1.2 RELATED SECTIONS

- A. Section 06 11 00 - Wood Framing
- B. Section 06 80 00 - Composite Fabrications
- C. Section 13 34 19 - Metal Building Systems

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Lag Screws
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Simpson Strong Tie
 - 5956 West Las Positas Blvd.
 - Pleasanton, CA 94588
 - Phone: 800-925-5099
 - www.strongtie.com
 - 1. Available through Simpson Strong Tie.

2.2 PRODUCTS

- A. 3/8" Lag Screw [CSI 06 05 23.B1]
 - 1. Location: Roofs of the Living Module, Core Module, Flex OM, and OM Closets
- B. 1/2" Lag Screw [CSI 06 05 23.B2]
 - 1. Location: OM Canopy
- C. Simpson Tie Adjustable and Standoff Post Base - 4x4 Connector [CSI 06 05 23.N9]
 - 1. Model Number: ABA44
 - 2. Location: under site wall
 - 3. Dimensions [L x W x H]: 3-1/8" x 3-9/16" x 3-1/16"
 - 4. Finish: galvanized
 - 5. Anchor diameter: 1/2"
 - 6. 16 gauge plate, 16 gauge base cover
- D. Simpson Tie Adjustable and Standoff Post Base - 6x6 Connector [CSI 06 05 23.N17]
 - 1. Model Number: ABE66
 - 2. Location: under ramps and Deck

3. Dimensions [L x W x H]: 5-7/16" x 5-1/2" x 3-1/8"
4. Finish: galvanized
5. Anchor diameter: 5/8"
6. 12 gauge plate, 14 gauge base cover

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 06 05 23

SECTION 06 11 00: WOOD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all wood framing used for The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Design requirements: wood framing in wall assembly as specified in drawings. All wood used shall be #2 SPF or better.

1.3 RELATED SECTIONS

- A. Section 01 25 13 - Product Substitution Procedures
- B. Section 06 05 23 - Wood, Plastic, and Composite Fastenings
- C. Section 06 80 00 - Composite Fabrications
- D. Section 09 93 13.13 - Exterior Staining
- E. Section 13 34 19 - Metal Building Systems

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Georgia-Pacific Building Products
133 Peachtree Street NE
Atlanta, GA 30303
Phone: 404-652-4000
www.gp.com

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Blocking [CSI 06 11 00.A1]
- B. Bridging [CSI 06 11 00.A2]
- C. 1x_ Stock Furring: Refer to drawings for specific dimensions, use, and location.
- D. 2x_ Stock Lumber: Refer to drawings for specific dimensions, use, and location.
- E. 3x_ Stock Lumber: Refer to drawings for specific dimensions, use, and location.
- F. 4x_ Stock Lumber: Refer to drawings for specific dimensions, use, and location.
- G. Pressure Treated 2x_ Stock Lumber: Refer to drawings for specific dimensions, use, and location.
- H. Pressure Treated 4x_ Stock Lumber: Refer to drawings for specific dimensions, use, and location.
- I. Pressure Treated 6x_ Stock Lumber: Refer to drawings for specific dimensions, use, and location.

2.3 ACCESSORIES

- A. 2" Exterior Screws with T-20 star drive

PART 3 - EXECUTION

3.1 INSPECTION

- A. Lumber should be inspected for uniformity of appearance, quality and moisture content.

3.2 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. All decking and wood siding to be attached with specific exterior screws. Refer to the Construction Drawings for details.

END OF SECTION 06 11 00

SECTION 06 15 13: WOOD FLOOR DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all wood decking used for The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Design requirements: wood framing in wall assembly as specified in drawings. All wood used shall be #2 SPF or better.

1.3 RELATED SECTIONS

- A. Section 01 25 13 - Product Substitution Procedures
- B. Section 09 93 13.13 - Exterior Staining

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Georgia-Pacific Building Products
133 Peachtree Street NE
Atlanta, GA 30303
Phone: 404-652-4000
www.gp.com

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. 5/4" x 6" Stock Lumber
 - 1. Location: Great Porch, Deck, Ramps
 - 2. Treated with a pressure treated wood stain [Refer to Section 09 93 13.13 - Exterior Staining]

PART 3 - EXECUTION

3.1 INSPECTION

- A. Lumber should be inspected for uniformity of appearance, quality and moisture content.

3.2 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. All decking and wood siding to be attached with specific exterior screws. Refer to the Construction Drawings for details.

END OF SECTION 06 15 13

SECTION 06 16 00: SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the various types of sheathing used throughout The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 09 93 13.13 - Exterior Staining

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Georgia-Pacific Building Products
133 Peachtree Street NE
Atlanta, GA 30303
Phone: 404-652-4000
www.gp.com

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. Wall Sheathing

- 1. Plywood: Exposure 1, Structural I Sheathing
- 2. Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; AdvanTech Sheathing.
- 3. Span Rating and Nominal Thickness
 - a. 32/16, 5/8" [CSI 06 16 00.D8]
 - i. Location: Main House
 - b. 32/16, 3/4" [CSI 06 16 00.D11]
 - i. Location: Flex OM and OMs
 - c. Exterior Grade 3/4" [CSI 06 16 00.D12] [Refer to Section 09 93 13.13 - Exterior Staining]
 - i. Location: Flex OM Kitchen and OM Closets
- 4. Edge Profile: Flush.
- 5. Performance Standard: DOC PS2 and ICC-ES ESR-1785, 5 ply.
- 6. Exposure Time: Designed to resist weather exposure for 300 days.
- 7. Provide fastening guide on top panel surface with pre-spaced fastening symbols 24-inches [610 mm] on center spacing.

B. Roof Sheathing

- 1. Plywood: Exposure 1, Structural I Sheathing.

2. Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; AdvanTech Sheathing.
 3. Span Rating and Nominal Thickness
 - a. 40/20, 3/4" [CSI 06 16 00.D11]
 - i. Location: Main House and Flex OM
 4. Edge Profile: Tongue and groove.
 5. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 24-inches on center spacing.
- C. Subflooring
1. Plywood: Exposure 1, Structural I Sheathing
 2. Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; AdvanTech Flooring
 3. Span Rating and Nominal Thickness
 - a. 16 O.C., 3/4" [CSI 06 16 00.D11]
 - i. Location: Main House and Flex OM
 4. Edge Detail: Tongue and groove.
 5. Surface Finish: Fully sanded face.
 6. Performance Standard: DOC PS2.
 7. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 24-inches [610 mm] on center spacing.
- D. Finished Flooring
1. Plywood: Exposure 1, Structural I Sheathing
 2. Location: Flex Space Floor
 3. Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; AdvanTech Sheathing.
 4. Span Rating and Nominal Thickness
 - a. 1/2" [CSI 06 16 00.A3]
 5. Edge Profile: Flush.
 6. Performance Standard: DOC PS2 and ICC-ES ESR-1785, 5 ply.
 7. Exposure Time: Designed to resist weather exposure for 300 days.
 8. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 24-inches [610 mm] on center spacing.
- E. Ceiling
1. Plywood: Exposure 1, Structural I Sheathing
 2. Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; AdvanTech Flooring
 3. Span Rating and Nominal Thickness

- a. Exterior Grade 3/8" [CSI 06 16 00.D5] [Refer to Section 09 93 13.13 - Exterior Staining]
 - i. Location: Underneath Main House and Flex OM
4. Edge Profile: Flush.
5. Surface Finish: Fully sanded face.
6. Performance Standard: DOC PS2.
7. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 24-inches [610 mm] on center spacing.

F. Miscellaneous Uses

1. Plywood Combination Subfloor-Underlayment: Exposure 2 layers of floor panels cross laid.
2. Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; AdvanTech Sheathing.
3. Nominal Thickness:
 - a. Treated 1/2" Plywood [CSI 06 16 00.A3] [Refer to Section 09 93 13.13 - Exterior Staining]
 - i. Location: Bearing pads for site walls, ramps, and deck throughout The Solar Homestead
 - b. Treated 3/4" Plywood [CSI 06 16 00.D11] [Refer to Section 09 93 13.13 - Exterior Staining]
 - i. Location: Sleepers elevating supply water tanks and waste water bladders
4. Edge Profile: Flush.
5. Provide fastening guide on top panel surface with pre-spaced fastening symbols for 24-inches [610 mm] on center spacing.

G. Interior Finish

1. MDF Panels
2. Wood Fiber: 100 percent post-industrial recycled wood residuals.
3. Binder: Formaldehyde-free adhesive system.
4. Nominal Thickness:
 - a. 3/4" [CSI 06 16 00.C5] ripped to 3-1/4" boards
 - i. Location: Core Module walls

2.3 ACCESSORIES

A. Fasteners

1. Provide fasteners of size and type indicated that comply with requirements specified in this article by the authority having jurisdiction, International Building Code, International Residential Code, Wood Frame Construction manual, and National Design Specification

B. Adhesives

1. Adhesives for Field Gluing Subfloor Panels to framing: Polyurethane-based formulation complying with APA AFG-01 or ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
2. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D [EPA Method 24].

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. Comply with manufacturer's recommendations.

3.2 INSTALLATION

- A. Install all sheathing and subflooring plumb, square and true to line.
- B. Install all sheathing and subflooring as specified in the drawings.
- C. Wood Structural Panel
 - 1. Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
 - 2. Fastening Methods
 - a. Combination Subfloor-Underlayment: Glue and screw to wood framing.
 - i. Space panels 1/8 inches apart at edges and ends.
 - ii. Install fasteners 3/8 inches to 1/2 inches from panel edges.
 - iii. Space fasteners 6 inches on centers on supported edges [4-foot ends], and 12 inches [305 mm] on centers at intermediate support locations.
 - iv. Penetrate wood framing members at least 1 inch.
 - b. Wall and Roof Sheathing:
 - i. Screw to wood framing.
 - ii. Space panels 1/8 inch apart at edges and ends.
 - iii. Install fasteners 3/8 inch to 1/2 inch from panel edges.
 - iv. Space fasteners in compliance with requirements of authority having jurisdiction.

END OF SECTION 06 16 00

SECTION 06 16 53: MOISTURE-RESISTANT SHEATHING BOARD**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all moisture resistant sheathing board in the bathrooms in The Solar Homestead and the Flex OM.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract apply to this section.

1.3 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. USG Corporation
550 West Adams Street
Chicago, IL 60661-3676
Phone: 800-950-3839
www.usg.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Moisture Resistant Sheathing Board
 - 1. Model Number: Sheetrock® Mold Tough™
 - 2. Location: Core Module Bath
 - 3. 1/2" moisture resistant
 - 4. 4' x 8' panels
 - 5. Must meet termite resistance requirements of AWWA E1-97, ASTM D3345-74; ASTM D 1758; AWWA E7-93, fastener holding strength of ASTM D-1037, and be a Class A Fire Retardant Material.

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

- A. UL Classified fire resistance, surface burning characteristics and non-combustibility [Type SLX].
- B. Per ASTM E84, flame spread is 20; smoke developed is 0.

3.2 DELIVERY, STORAGE, AND HANDLING

- A. Exercise care to prevent crushing of edges with cargo hold down straps during transportation.
- B. Carefully load and unload products from trucks to prevent damage.

C. If product must be stored outside, elevate off of the ground on sleepers and cover to protect from weather.

3.3 INSTALLATION

A. Install all sheathing plumb, square, and true to line.

END OF SECTION 06 16 53

SECTION 06 17 53: SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the shop-fabricated wood trusses used for the Main House.

1.2 SYSTEM DESCRIPTION

- A. Fabricator Qualifications: Deltec participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to architect and authorities having jurisdiction.
- B. Comply with applicable requirements and recommendations of the following publications
 1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
 2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
 3. TPI BCSI, "Guide to Good Practice for Handling, Installing, Restraining & Bracing Metal Plate Connected Wood Trusses."
 4. Code Compliance: AC14 2004, AC162 2000, ASTM 5055-00a [2000]
 5. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads indicated without exceeding TPI 1 deflection limits.

1.3 SUBMITTALS

- A. Shop Drawings
- B. Structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Deltec
69 Bingham Road
Asheville, NC 28806
Phone: 800-642-2508
www.deltechomes.com
 1. Available through Deltec.

2.2 PRODUCT

- A. Deltec Trusses
 1. Location: Main House
 2. Dimensions [L x D]: 24' x 14"
 3. Spacing: 12" o.c.
 4. Species: southern yellow pine

5. Structural properties: Provide units with depths and design values not less than those indicated in structural calculations.
6. Provide units complying with APA PRI-400, factory marked with nominal joist depth, joist class, span ratings, mill identification, and compliance with APA standard.

2.3 ACCESSORIES

- A. Connector Plates: TPI 1, fabricated from hot-dip galvanized-steel sheet complying with ASTM A 653/A 653M; Structural Steel [SS], high-strength low-alloy steel Type A [HSLAS Type A], or high-strength low-alloy steel Type B [HSLAS Type B]; Z180 coating designation; and not less than 0.9 mm thick. 18 gauge G60 galvanized metal.
- B. Fasteners: Where trusses are exposed to weather or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- C. Metal Framing Anchors: Provide framing anchors made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, Z180 coating designation.

2.4 FABRICATION

- A. Assemble trusses using jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted. Fabricate wood trusses within manufacturing tolerances in TPI 1

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install and brace trusses according to manufacturer's recommendations. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- B. Do not cut or remove truss members.
- C. Remove trusses that are damaged or do not meet requirements and replace with trusses that do meet requirements.

END OF SECTION 06 17 53

SECTION 06 20 23: INTERIOR FINISH CARPENTRY**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes information on the Core Module bathroom vanity and wood shelving in the Living Module. Refer to details in Construction Documents.

1.2 SYSTEM REQUIREMENTS

- A. Comply with ASTM Codes

1.3 RELATED SECTIONS

- A. Section 09 93 13.13 - Exterior Staining

1.4 SUBMITTALS

- A. Shop Drawings

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Available at national lumber yards and hardware chain stores, such as Lowes.

2.2 PRODUCT

A. Black Locust Wood Vanity

1. Location: Core Module Bath
2. Top of vanity [W x D]: 24" x 24"
3. Base of vanity [W x H]: 30" x 24"
4. Board size: 5-1/2"
5. Weight: 48.2 lbs/ft³
6. Finish: natural white vinegar stain and protective clear coat [Refer to Section 09 93 13.13 - Exterior Staining]
7. Resistance to insects & decay: high

B. 3/4" White Pine Shelving

1. Location: Bay Window
2. Dimensions [W x D]: 15" x 17"
3. Thickness: 3/4"
4. Finish: protective clear coat [Refer to Section 09 93 13.13 - Exterior Staining]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Condition finishes carpentry in installation areas for 24 hours before installing.

- B. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Scribe and cut to fit adjoining work. Refinish and seal cuts.
- C. Select and arrange paneling for best match of adjacent units. Install with uniform tight joints.

END OF SECTION 06 20 23

SECTION 06 46 00: WOOD TRIM**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all wood trim used throughout The Solar Homestead.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Georgia-Pacific Building Products
133 Peachtree Street NE
Atlanta, GA 30303
Phone: 404-652-4000
www.gp.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Base and Crown Molding
 - 1. Location: exterior walls of Core
 - 2. 1x4 pine
- B. Jamb Extensions
 - 1. Location: around all windows and doors
 - 2. 1x8 pine
- C. Window Casing
 - 1. Location: Flex Space
 - 2. 1x4 pine
- D. Closet Door Trim
 - 1. Location: Bedroom Closets
 - 2. 1x2 pine

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with Construction Documents.

END OF SECTION 06 46 00

SECTION 06 61 00: SIMULATED STONE FABRICATIONS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes simulated stone fabrications or equivalent product as approved by the architect for bathroom and shower details as mounting blocks.

1.2 RELATED SECTIONS

- A. Section 01 25 13 - Product Substitution Procedures

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Grainger
 - 7 11th Street NW
 - Hickory, NC 28601
 - Phone: 800-323-0620
 - www.grainger.com
 - 1. Available through Grainger.

2.2 PRODUCTS

- A. Grainger Delrin
 - 1. Model Number: 2VEP6
 - 2. Location: Core Module Bath
 - 3. Dimensions [L x W x D]: 12" x 12" x 1/4"
 - a. Product shall be cut down to sizes based on products. See Construction Documents for details.
 - b. Toilet paper roll [L x H]: 8" x 2-5/8"
 - c. Shower trim valve [L x H]: 8-1/2" x 7" with a 2-1/2" diameter hole in the center for plumbing
 - 4. Finish: white

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations and as detailed in Construction Documents.
- B. Form inconspicuous and nonporous joints.

END OF SECTION 12 36 61

SECTION 06 64 00: PLASTIC PANELING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the plastic polycarbonate paneling that will be used in The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Polycarbonate sheets will be used as a "light wall" inside the Flex Space and between the two bedrooms in the main house. The skylight [Refer to Section 08 63 00 - Metal-Framed Skylights] located in the Core Module will also use polycarbonate sheets.

1.3 RELATED SECTIONS

- A. Section 08 63 00 - Metal-Framed Skylights

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Polygal Inc.
PO Box 410592
Charlotte, NC 28241
Phone: 800-537-0095
www.polygal-northamerica.com
 - 1. Available at Polygal Inc. or other online plastic suppliers.

2.2 PRODUCTS

- A. Polygal Titan Sky
 - 1. Location: Bedroom Module, Core Module, Flex Space
 - 2. 4' x 8' sheets on 16" o.c. stud wall
 - 3. 16 mm for the "light walls" in the Flex Space and the Bedroom Module
 - 4. 8 mm for skylight covers in the Core Module
 - 5. Weight: 0.51 lb/ft²
 - 6. Finish: ice
 - 7. Light transmission: 32%

2.3 ACCESSORIES

- A. Steel washers
- B. Steel squarehead screws

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with construction details.

END OF SECTION 06 64 00

SECTION 06 80 00: COMPOSITE FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the composite fabrications used to create the foundation system in conjunction with the manufactured steel trailers [Refer to Section 13 34 19 - Metal Building Systems] of The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 06 05 23 - Wood, Plastic, and Composite Fastenings
- B. Section 06 11 00 - Wood Framing
- C. Section 13 34 19 - Metal Building Systems

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Uline
12575 Uline Drive
Pleasant Prairie, WI 53158
Phone: 800-958-5463
www.uline.com
 - 1. Available through Uline.
- B. Abesco Distributing, Inc.
5851 Florin Perkins Road
Sacramento, CA 95828
Phone: 800-382-8831
www.abseco.org
 - 1. Available through Abesco Distributing, Inc.
- C. RubberForm Recycled Products, LLC
75 Michigan Street
Lockport, NY 14094
Phone: 866-424-6981
www.rubberform.com
 - 1. Available through RubberForm Recycled Products, LLC.

2.2 PRODUCTS

- A. Uline Burlap Sacks [CSI 06 80 00.A1]

1. Model Number: S-12332
 - a. Location: underneath Ramps, Deck, and Site Walls
 - b. Dimensions [L x W]: 20" x 36"
 - c. Weight: 10 oz
 2. Model Number: S-15524
 - a. Location: underneath scissor jacks [Refer to Section 13 34 19 - Metal Building Systems]
 - b. Dimensions [L x W]: 36" x 48"
 - c. Weight: 10 oz
- B. Abesco ABS Foundation Pads [CSI 06 80 00.A2]
1. Model Number: 513
 2. Location: underneath Ramps, Deck, Site Walls, and scissor jacks [Refer to Section 13 34 19 - Metal Building Systems]
 3. Dimensions [L x W x D]: 24" x 24" x 1"
- C. RubberForm Recycled Rubber Pads [CSI 06 80 00.A3]
1. Model Number: Custom
 2. Location: underneath Ramps, Deck, Site Walls, and scissor jacks [Refer to Section 13 34 19 - Metal Building Systems]
 3. Dimensions [L x W x D]: 14" x 14" x varies between 1/2" to 1" depending on site
 4. Compressive design loads up to 1,500 psi
 5. Ultimate compressive strength of 10,000 psi

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Burlap Sacks shall be filled with sand and folded over then placed under the Foundation pads to distribute the load over the soil evenly.
- B. ABS Foundation Pads shall be placed beneath the Recycled Rubber Pads and shall vary in thickness in order to accommodate changes in the grade of the site and level the supported manufactured steel trailers above.
- C. Recycled Rubber Pads bear the load of the manufactured steel trailers and transfer the load to the other products and finally to the ground.
- D. Install in accordance with manufacturer's recommendations.

END OF SECTION 06 80 00

SECTION 07 13 00: SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the sheet waterproofing that will wrap the Main House and Flex OM.

1.2 REFERENCES

- A. Comply with all ASTM International, AATCC, and TAPP codes

1.3 SYSTEM DESCRIPTION

- A. DuPont Tyvek ThermaWrap Membrane: A low-emissivity metalized surface designed to manage radiant heat flow through wall systems to help improve energy efficiency.

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. DuPont
 - 1007 Market Street
 - Wilmington, DE 19898
 - Phone: 800-441-7515
 - www.dupont.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. DuPont Tyvek ThermaWrap
 - 1. Model Number: D1349991
 - 2. Location: Main House and Flex OM
 - 3. Dimensions [L x W]: 9' x 150'
 - 4. R-Value: R-2
 - 5. Water penetration resistance: 210 cm
 - 6. UV exposure: 120 days

2.3 ACCESSORIES

- A. DuPont Tyvek Tape
- B. DuPont Tyvek Wrap Caps

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories

3.2 DELIVERY, STORAGE & HANDLING

- A. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store weather barrier materials as recommended by weather barrier manufacturer.

3.3 WARRANTY

- A. Weather barrier manufacturer's warranty for weather barrier for a period of ten years from date of substantial completion.

3.4 INSTALLATION

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations prior to installation of windows and doors.
- B. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap
- C. Install weather barrier silver side facing air space.
- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level
- E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface. 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
- F. Window and Door Openings: Extend weather barrier completely over openings.
- G. Overlap weather barrier: Exterior corners: minimum 12 inches. Seams: minimum 6 inches.

END OF SECTION 07 13 00

SECTION 07 13 26: SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes self-adhering sheet waterproofing as a roof underlayment for the Main House and Flex OM.

1.2 REFERENCES

- A. American Society for Testing and Materials [ASTM]
 1. D412 Standard Test Methods for Vulcanized Rubber and Elastomeric Tension
 2. D461 Standard Test Methods for Felt
 3. D903 Test Methods for Peel or Stripping Strength of Adhesive Bonds
 4. D3767 Standard Practice for Rubber—Measurement of Dimensions
 5. E96 Standard Test Methods for Water Vapor Transmission of Materials

1.3 SYSTEM DESCRIPTION

- A. Grace Ice and Water Shield: A self-adhered membrane roofing underlayment offers premium leak protection for sloped roofs subject to the effects of ice dams or wind driven rain. The membrane is designed to be applied to the roof deck prior to the application of the finished roof coverings.

1.4 RELATED SECTIONS

- A. Section 06 11 00 - Wood Framing
- B. Section 07 21 13 - Board Insulation

1.5 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Grace Construction Products
62 Whittemore Avenue
Cambridge, MA 02140
Phone: 866-333-3726
www.graceconstruction.com
 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. Grace Ice and Water Shield
 1. Model: 5003002
 2. Location: Main House and Flex OM
 3. Dimensions [L x W]: 75' x 36"

4. Weight: 62 lbs
5. Color: gray-black
6. Thickness: 40 mil [1.02 mm]
7. Tensile strength: 250 psi [1720 kPa]
8. Maximum permeance: 0.05 perms

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations and as shown on Construction Documents.

END OF SECTION 07 13 26

SECTION 07 21 13: BOARD INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the board insulation for the Main House and Flex OM on the walls, roofs, and beneath the floor.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. GreenGuard Pactiv
1900 West Field Court
Lake Forest, IL 60045
Phone: 800-241-4402
www.greenguard.pactiv.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. GreenGuard Type IV Board Insulation
 - 1. Location: Main House and Flex OM
 - 2. Dimensions [L x W]: 8' x 4'
 - 3. Edge treatment: square edge
 - 4. Minimum compressive strength: 25 psi
 - 5. 1" thickness for all walls and beneath the floor system with R-value of 5 [CSI 07 21 13.B2]

2.3 ACCESSORIES

- A. Adhesive: single-component, polyurethane adhesives tested to:
 - 1. Underwriters Laboratory Inc. - UL 1897 Standard for Safety for Uplift Tests for Roof Covering Systems
 - 2. Factory Mutual Approvals for fire and wind uplift resistance for roof deck applications approved by Factory Mutual.
- B. Joint Closure Strips - Clip Strip Type: rigid PVC construction, J-channel shape, 1 inch [25 mm] nominal size
- C. Joint Closure Strips - Interlocking Type: rigid PVC construction, two piece male-to-female connection, 1 inch [25 mm] nominal size; female profile complete with pre-drilled holes spaced at 12 inches [300 mm] on center, both sides of attachment flange
- D. Joint Tape: 2.0 mil [0.051 mm] thick aluminum tape, 3 inches [75 mm] wide. Board joints must be clean prior to applying tapes.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply adhesives or sealants when substrate and ambient air temperatures are below 40°F [4°C].

3.2 DELIVERY, STORAGE AND HANDLING

- A. Store product in protected area to protect product from moisture or damage.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Install boards with long axis perpendicular to supports. Ensure end joints are fully supported.
- C. Install insulation boards to ensure board width spans not less than 3 framing supports.
- D. Cut and fit boards to suit project requirements.

END OF SECTION 07 21 13

SECTION 07 21 16: BLANKET INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes fiberglass batt insulation used in exterior staggered stud wall of the Main House and Flex OM.

1.2 REFERENCES

- A. ASTM E84 – Surface burning characteristics of building materials
- B. ASTM C518 – Thermal Resistance
- C. ASMT E96 – Water vapor transmission properties

1.3 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Johns Manville Corporate Offices
PO Box 5108
Denver, CO 80217-5108
Phone: 800-654-3103
www.jm.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Johns Manville Un-Faced Fiberglass Batt Insulation
 - 1. Model Number: U-1330
 - 2. Location: Main House and Flex OM interior walls
 - 3. Dimensions [L x W]: 93" x 15"
 - 4. Thickness: 3-1/2"
 - 5. R-Value: R-13
- B. Johns Manville Kraft-Faced Fiberglass Batt Insulation
 - 1. Model Number: K834
 - 2. Location: Main House and Flex OM exterior walls
 - 3. Dimensions [L x W]: 96" x 24"
 - 4. Thickness: 6-1/2"
 - 5. R-Value: R-19

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. When transporting, cover completely with a waterproof tarpaulin as necessary.
- B. Store indoors, and keep clean and dry.
- C. Wear safety glasses, leather or cotton gloves, long pants, and a long, loose-fitting shirt when handling insulation. If necessary, wear ear protection and respirator.

3.2 INSTALLATION

- A. Install in accordance with the manufacturer's recommendations.

END OF SECTION 07 21 16

SECTION 07 21 19: FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes foamed in place Icynene insulation for the Main House and Flex OM.

1.2 SYSTEM DESCRIPTION

- A. ICYNENE MD-R-200: a trademark for medium density, 100% water-blown polyurethane spray foam manufactured by Icynene. ICYNENE MD-R-200™ is a nominal 2 lbs/ft³ density, free rise material.
 - 1. Type III vapor retarder with low vapor permeance.
 - 2. 100 % water-blown foam insulation and air barrier material containing resins with pre- and post-consumer recycled content

1.3 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Icynene Inc.
 - 6747 Campobello Road
 - Mississauga ON
 - L5N 2L7 Canada
 - Phone: 800-758-7325
 - www.icynene.com
 - 1. All services and products are supplied by independent Icynene licensed dealers.
 - a. Available through Home Energy Partners.
 - 167 Haywood Road
 - Asheville, NC
 - Phone: 828-350-1155
 - www.homeenergypartners.com

2.2 PRODUCT

- A. Icynene Insulation
 - 1. Model Number: MD-R-200
 - 2. Location: Main House and Flex OM floor and roof, northeast corner of the Bay Window, south wall of the Core Module
 - 3. Thermal resistance: R/in = R5.2 hr ft² °F/BTU

4. Average insulation in a 2" x 4" stud wall: R-16 [3" foam] and R-26 [5" foam] for a 2" x 6"
5. Water vapor transmission properties: 1.3 perms @ 3"
6. Surface burning characteristics @ 2" thickness: flame spread of ≤ 25 and smoke development of ≤ 450
7. Water absorption: 0.57% by volume

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. ICYNENE MD-R-200 Resin ideally should be stored between 60°F and 90°F and never exceed 100°F.

3.2 INSPECTION

- A. Inspect stud cavity for proper installation methods prior to installing in The Solar Homestead.
- B. Verify all electrical, plumbing, and other trades have been coordinated prior to installation.

3.3 INSTALLATION

- A. Liquid components are manufactured on site and supplied by independent Icynene licensed dealers.
- B. Install by a licensed, trained dealer in accordance with manufacturer's recommendations.

END OF SECTION 07 21 19

SECTION 07 25 00: WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the weather barrier on the exterior of the OMs on the side facing the Great Porch as described in the Construction Documents.

1.2 REFERENCES

- A. ASTM E- 1677-95 "Standard Specification for an Air Retarder [AR] Material or System for Low-Rise Framed Building Walls"
- B. ASTM E-96-90 "Standard Test Method for Water Transmission of Materials"
- C. AATCC-127 "Hydrostatic Head Test"
- D. ASTM D-5733-9 Trapezoidal Test
- E. Air-Ins ASTM E-283 Canadian Air Barrier Materials Standard
- F. ASTM D-779 Dry Indicator Method, Water Penetration Resistance

1.3 SYSTEM DESCRIPTION

- A. VaproShield WallShield: WallShield is a vapor- and air- permeable water- resistive barrier for wall assemblies. WallShield is used as a concealed or semi-concealed underlayment behind wall cladding systems, including siding and shingles, metal and composite panels, EIFS and stucco, and masonry veneers.

1.4 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. VaproShield, LLC
915 26th Avenue
NW Gig Harbor, WA 98335
Phone: 866-731-7663
www.vaproshield.com
 - 1. Available through Premier Building Products, Inc
212 North McDowell Street
Suite 110
Charlotte, NC 28204
Phone: 704-376-0310
www.premierbldgproducts.com

2.2 PRODUCTS

- A. VaproShield WallShield Water-Resistive Barrier
 - 1. Model Number: 10309000
 - 2. Location: east wall of OM Closets
 - 3. Dimensions [L x W]: 59" x 164' [1.5 m x 50 m]
 - 4. Weight: 34 lbs [12 kg]
 - 5. Finish: black

2.3 ACCESSORIES

- A. VaproTape UV Black
 - 1. Model Number: 60304500
 - 2. Location: east wall of OM Closets
 - 3. Dimensions [L x W]: 4" x 50'
 - 4. Weight: 4.16 lbs
 - 5. Finish: black

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

- A. Submit copies of test results showing performance characteristics equaling or exceeding those specified.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 07 25 00

SECTION 07 46 19: STEEL SIDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes steel siding for the Main House, Core Module Bath, OM Closets and Outdoor Kitchen as described in the Construction Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Union Corrugating Company
701 South King Street
Fayetteville, NC 28301
Phone: 800-685-7663
www.unioncorrugating.com
 1. Available at national chain hardware stores, such as Lowes.
- B. Metal Tech-USA
611 Highway 74
Suite 900
Peachtree City, GA 30269
Phone: 770-486-8825
www.metaltech-usa.com
 1. Available through Metal Tech-USA.

2.2 PRODUCTS

- A. Union Corrugated Metal Siding
 1. 2.67" x 1/2" Corrugated Metal Panel [CSI 07 46 19.A1]
 - a. Location: Core Module Bath
 - b. 26 gauge
 - c. Finish: galvalume
 2. 2.67" x 7/8" Corrugated Metal Panel [CSI 07 46 19.A2]
 - a. Location: OM Closets, Barn Door
 - b. 24 gauge
 - c. Finish: galvalume
- B. Metal-Tech Perforated Corrugated Metal Siding
 1. 2.67" x 7/8" Aluminum Perforated Corrugated Metal Panel [CSI 07 46 19.A11]

- a. Location: Bay Window, HVAC Compartment, Outdoor Kitchen
- b. Finish: metallic silver
- c. 18 gauge
- d. Openness: 46%
- e. Hole staggered spacing: 3/16"

2.3 ACCESSORIES

- A. Rubber gasketed screws as recommended by manufacturer.
- B. Metal-Tech 1" Aluminum J Channel [CSI 07 49 19.B1]
 1. 18 gauge
- C. Metal-Tech 4" Aluminum Corner Trim [CSI 07 49 19.B2]
 1. Dimensions [L x W x D]: 10'-6" x 2" x 2"
 2. 18 gauge
- D. Metal-Tech 4" Aluminum Straight Trim [CSI 07 49 19.B3]
 1. 18 gauge

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations. Lap siding as recommended by manufacturer.
- B. Seal joints and penetrations through weather resistive barrier with rubber gasket screws.
- C. Install accessories according to construction drawings.

END OF SECTION 07 46 19

SECTION 07 46 23: WOOD SIDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes wood siding to be installed as exterior wall sheathing for The Solar Homestead as described in the Construction Documents.

1.2 SYSTEM DESCRIPTION

- A. Channel siding is a type of lap siding in which the profile of each board partially overlaps that of the board of next to it, creating a channel that gives shadow line effects, providing excellent weather protection and allowing for dimensional movement. Channel siding will be applied vertically to the exterior of The Solar Homestead.

1.3 RELATED SECTIONS

- A. Section 09 93 13.13 - Exterior Staining

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Western Red Cedar Lumber Association
1501-700 West Pender Street
Pender Place 1
Business Building
Vancouver B.C.
Canada V6C 1G8
Phone: 866-778-9096
www.wrcla.org
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Vertical Cedar Siding
 - 1. Location: exterior of Main House
 - 2. Dimensions [D x W]: 1" x 8"
 - 3. Finish: Mark Twain Gray Brick [Refer to Section 09 93 13.13 - Exterior Staining]
 - 4. Channel rustic milled 8" cedar siding with 6" exposure attached to furring strips
 - 5. Species: Western Red Cedar
 - 6. Product pattern: channel siding
 - 7. Grade: select knotty
 - 8. Moisture content: kiln-dried

- 9. Surface to be exposed: sawn face

2.3 ACCESSORIES

- A. Concealed finish nails

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Lap siding as recommended by manufacturer and shown on Construction Documents with 6" exposure.

END OF SECTION 07 46 23

SECTION 07 46 23.13: WOOD BARK SHINGLE SIDING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the furnishing and installation of wood bark shingle siding as the exterior wall sheathing of the Flex OM and Barn Door location on front of The Solar Homestead as described in the Construction Documents.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Highland Craftsmen, Inc.
534 Oak Avenue
Spruce Pine, NC 28777
Phone: 828-765-9010
www.barkhouse.com
 - 1. Available through Highland Craftsmen, Inc.
- B. G.M.C. Roofing & Building Paper Products, Inc.
6400 Zerker Road
Shafter, CA 93263
Phone: 661-399-6136
www.gmcpaper.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. Highland Craftsmen Bark House Pioneer Shingle
 - 1. Location: Flex OM, exterior of Main House south wall
 - 2. Lengths: 26"
 - 3. Widths: 6" minimum to 4' maximum [average shingle width is 13" and wider]
 - 4. Thickness: 1/2" minimum to 7/8" maximum
 - 5. Finish: yellow poplar
 - 6. Moisture content: approximately 6-8% guaranteed Kiln Dried & Heat Sterilized
 - 7. Squared: re-squared to exact 90 degree edges for precise installation
 - 8. Appearance graded for performance and appearance. 100% usable sound bark. No open defect, no brown scaly bark.

2.3 ACCESSORIES

- A. G.M.C. Roof Felt
 - 1. Model Number: No. 30 Felt
 - 2. Location: Flex OM, exterior of Main House south wall
 - 3. Dimensions [L x W]: 72' x 36"
 - 4. Coverage area: 216 ft²
 - 5. Color: black

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions with a 15" to 18" exposure. Refer to details in Construction Documents. Use fasteners as recommended by manufacturer.

END OF SECTION 07 46 23.13

SECTION 07 54 23: THERMOPLASTIC-POLYOLEFIN ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the thermoplastic-polyolefin roofing for the Main House, OM Closets, and Flex OM as outlined below.

1.2 SYSTEM DESCRIPTION

- A. Apply the Firestone thermoplastic-polyolefin roofing in conjunction with tapered polyisocyanurate insulation over the wood roof deck.

1.3 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Firestone Building Products
250 West 96th Street
Indianapolis, IN 46260
Phone: 800-428-4442
www.firestonebpco.com
 - 1. Available through Firestone Building Products.
- B. Dimensional Metals, Inc.
819 South Salisbury GQ Avenue
Salisbury, NC 28146
Phone: 704-279-9691
www.dmimetals.com
 - 1. Available through Dimensional Metals, Inc.

2.2 PRODUCT

- A. Firestone Thermoplastic Polyolefin [TPO] Membrane
 - 1. Model Number: UltraPly TPO
 - 2. Location: Main House, OM Closets, Flex OM
 - 3. Thickness: 0.045", 0.060" over the reinforcing scrim [top-ply thickness]
 - 4. Color: white

2.3 ACCESSORIES

- A. Tapered Polyisocyanurate Insulation [CSI 07 54 23.A1]
 - 1. 4'x8' panels with a varied thickness of 1" to 2-1/2" with R-value of 19

- B. Fasteners and Plates
 - 1. HailGuard Fasteners
- C. Metal Edging and Membrane Terminations
 - 1. Metal fascia/drip edge system with a 24-gauge continuous anchor cleat and 32 mil thick clear anodized aluminum.

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

- A. The TPO membrane roofing system must achieve a UL Class A, B or C and must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code [ASCE-7] or ANSI/SPRI WD-1.
- B. The Sure-Weld White TPO membrane meets the emittance requirements set forth by the USGBC [U. S. Green Building Council] for their LEED [Leadership in Energy and Environmental Design] Program. The Sure-Weld White TPO material has an emittance of 0.95 [when tested in accordance with ASTM E408] and an SRI [solar reflectance index] of 110 [calculated using ASTM E 1980].

3.2 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with the manufacturer's written instructions for proper material storage.
 - 1. Store Sure-Weld membrane in the original undisturbed plastic wrap in a cool, shaded area. Sure-Weld membrane that has been exposed to the elements for approximately 7 days must be prepared with Carlisle Weathered Membrane Cleaner prior to hot air welding.
 - 2. Store curable materials [adhesives and sealants] between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 - 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
- B. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.
- C. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid standing water.

END OF SECTION 07 54 23

SECTION 07 55 63: VEGETATED PROTECTED MEMBRANE ROOF**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the Xero Flor Green Roof System will be used for the roof of the Flex OM over the thermoplastic-polyolefin roofing. Refer to Construction Documents for further details.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Xero Flor America, LLC
3821 East Geer Street
Durham, NC 27704
Phone: 919-683-1073
www.xeroflora.com
- A. Available at Xero Flor America, LLC.

2.2 PRODUCTS

- A. Xero Flor Root Barrier
 - 1. Model Number: XF112
 - 2. Location Flex OM
- B. Xero Flor Drain Mat
 - 1. Model Number: XF108H
 - 2. Location: Flex OM
 - 3. Dimensions [L x W]: 197' x 39-3/8"
- C. Xero Flor Water Retention Fleece
 - 1. Model Number: XF157
 - 2. Location: Flex OM
 - 3. Dimensions [L x W]: 66' x 65"
- D. Xero Terr Growing Medium: A mixture of lightweight, mineral based materials; including porous aggregate and organic matter derived from composted plant material.
- E. Materials, biosolids, and/or manure compost.

2.3 ACCESSORIES

- A. Gravel Walkway: Decorative gravel walkway laid evenly from the edge of roof to fall protection in a 1'-0" perimeter around fall protection except for the side that leads to the roof edge.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. Covered trailer will deliver materials to the competition site.
- B. Conditioned trailer will deliver green roof plants to the competition site.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's recommendations by certified contractors.
- B. The surface of the roof shall be swept free of debris prior to installing the green roof system.

END OF SECTION 07 55 63

SECTION 07 65 00: FLEXIBLE FLASHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all flexible flashing used for The Solar Homestead.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. CertainTeed
 - PO Box 110
 - 1400 Union Meeting Road
 - Blue Bell, PA 19422
 - Phone: 610-341-7000
 - www.certainteed.com
 - 1. Available through Miller Industries
 - 1134 West King Street
 - Boone, NC 28607
 - Phone: 828-264-2834
- B. Metal Sales Manufacturing
 - 118 Quality Drive
 - Mocksville, NC 27028
 - Phone: 800-406-7387
 - www.metalsales.us.com
 - 1. Available through Mountain Lumber.
 - 6812 Spring Hill Road
 - Ruckersville, VA 22968
 - Phone: 800-445-2671
 - www.mountainlumber.com

2.2 PRODUCTS

- A. CertainTeed Aluminum Flashing
 - 1. Model Number: 36629286
 - 2. Location: Great Porch Canopy
 - 3. Dimensions [W x L]: 24" x 50'
 - 4. Finish: sterling gray
 - 5. Smooth two coat finish

- B. Metal Sales Galvalume Flashing
 - 1. Location: OM Closets, Trombe Wall
 - 2. Dimensions [W x L]: 24" x 50'
- C. Metal Sales Galvalume Scuppers
 - 1. Location: Main House
 - 2. Dimensions [W x L]: 24" x 50'

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Cut and bend to sizes for the flashing and scuppers as detailed in the Construction Documents.

END OF SECTION 07 65 00

SECTION 07 71 13: MANUFACTURED COPINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all information for factory fabricated and finished coping systems used for The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. W.P. Hickman Company
PO Box 15005
Asheville, NC 28813
Phone: 828-274-4000
www.wph.com

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Permasnap Parapet Wall Coping
 - 1. Location: Main House
 - 2. Metal: 0.050" aluminum for all sizes
 - 3. Coping Cap: length of 10' [3048 mm]; width of 13"
 - 4. Coping vertical face and back leg: standard 4" [100 mm] nominal; custom size by request.
 - 5. Internal splice plates: concealed with matching finish to maintain outside face continuity.
 - 6. Coping Cleat: 20 gauge galvanized steel anchor cleat; normally 12" [305 mm] wide @ 5' [1524 mm] on center to be mechanically fastened as indicated and detailed.
 - 7. Gutter/support chair: Metal Gutter Chair in color and finish to match coping cap.
 - 8. Fasteners: stainless steel screw type with a minimum pull-out resistance of 240 Number [109 kg] as supplied by the manufacturer per substrate application. No exposed fasteners permitted.
 - 9. Finish: anodized aluminum, color shall be clear finish.

2.3 ACCESSORIES

- A. Corners, end caps, pier caps, etc. shall be fabricated by the coping manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

- B. Installer shall use mechanical fasteners with minimum 240 Number [109 kg] pull-out resistance suitable for parapet substrates.

END OF SECTION 07 71 13

SECTION 08 14 23.13: METAL-FACED WOOD DOORS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes 4-17/32 inch [115mm] stile Ultra Series Inswing Entrance doors complete with hardware, glazing, weatherstripping, screens, jamb extensions, stationary panel, stationary sidelite and standard or specified anchorages, trim, attachments, and accessories [CSI 08 14 23.13]. Used for exterior doors for the Main House and Flex OM.

1.2 REFERENCES

- A. Compliance with American Society for Testing and Materials [ASTM], Window and Door Manufacturers Association [AAMA/WDMA], American National Standards Institute/Window and Door Manufacturers Association [ANSI/WDMA], National Fenestration Rating Council [NFRC], WDMA Hallmark Program, Consumer Product Safety Commission [CPSC].

1.3 SYSTEM DESCRIPTION

- A. Design and Performance Requirements

- 1. Standard Performance windows include residential application [design pressure required 55psf].

- B. Energy Ratings

- 1. All units tested are one-lite, residential, LoE²-270, argon filled, with Kolbe ID No. as listed on the NFRC label adhered to each unit. Values are certified per NFRC and units are labeled per state requirements.
 - 2. R-5 glass panes installed by manufacturer.

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kolbe & Kolbe Millwork Co., Inc.

- 1323 S. 11th Ave

- Wausau, WI 54401

- Phone: 715-842-5666

- www.kolbe-kolbe.com

- 1. Available through Kolbe & Kolbe Millwork Co., Inc. and national chain hardware stores.

2.2 PRODUCT

- A. Frame: Constructed of kiln-dried pine, with pine interior stops, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A. Ultra assembled frames have factory installed heavy vinyl nailing fins at head and side jambs. Nailing fin at head has integral drip cap.

- 1. Jamb Thickness: Head and side jambs are 3/4 inch [19mm] on the interior; 1-5/16 inch [33mm] exterior.
 - 2. Basic Jamb Width: Extended jamb width 7 inch [178mm].
 - 3. Sill Thickness: Handicap sill is 1/2 inch [13mm] meeting ADA requirements.

4. Sill: Handicap sill is 8-1/8 inch wide [206mm] wide with thermal break, made of bronze anodized 1/8 inch [3.2mm] thick 6063 extruded aluminum alloy.
 5. Exterior: Head and side frame parts are .050 inch [1.3mm] thick 6063 extruded aluminum alloy with accessory grooves, press fit onto the wood frame.
 6. Corner Construction: Mitered corners use internal corner key and sealer.
 7. Other wood species available: Pine [standard] on exposed wood frame components.
- B. Panels: Direct set sidelites are constructed of glass directly set into frame. Sash set sidelites are constructed of kiln dried pine, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A.
1. Thickness: 1-23/32 inch [44mm].
 2. Top Rails: Face dimension is 4-17/32 inch [115mm] for wide stile units.
 3. Stiles: All lock stiles are constructed of laminated veneer lumber with solid wood edge banding. Face dimension is 4-17/32 inch [115mm].
 4. Bottom Rail: Face dimension is standard 7-9/16 inch [192mm].
 5. Exterior: Panel parts on doors are completely covered by a .062 inch [1.6mm] thick 6063 extruded aluminum alloy with all corners coped and sealed.
 6. Other wood species and LVL with wood veneers available: Pine [standard] on exposed wood sash components.
 7. Interior glazed.
 8. Fixed panels are installed with panel spacers to ensure proper margin.
 9. Prep for locks, hinges, and handle boring.
- C. Surface Finish:
1. Exterior Finish – Aluminum
 - a. Aluminum Anodized: Exterior Components: Exterior aluminum frame and sash components are to have an anodized finish in compliance with AAMA 611-98 specifications. The anodized finish is to be clear.
 2. Interior Finish - Wood:
 - a. Interior wood is to be treated bare wood without stain or top coat.
- D. Hardware:
1. Handles and escutcheon plates: Active handle, inactive handle, interior and exterior escutcheon plates are made of solid brass with protective lacquer. Gasket is made of Black Neoprene. All handles are shipped for field installation. Toronto handle is standard on Patio units and optional on Entrance units. Color: Satin Nickel.
 2. Locking hardware has a 1 inch [25mm] throw deadbolt with Schlage key lock cylinder. Color: Satin Nickel.
 3. Locking system options: All components are corrosion resistant. Plastic sill block is made of Bronze ABS with UV inhibitor.
 - a. Single point: On single door. Made of stainless steel. Standard tongue strike.
 4. Adjustable shoot bolt strike: made of Stainless Steel.
 5. Hinge:
 - a. Standard adjustable set hinge: 4" x 3-5/8" [102 x 92mm] hinge with 5/8 inch [16mm] radius corners. Steel reinforced and corrosion resistant. Color: Satin Nickel.

E. Weatherstripping:

1. Frame head and side jambs: polypropylene rigid santoprene flex kerf-mounted weatherstrip, available in Beige.
2. Weep sill: polypropylene weatherstripping on the exterior of the bottom panel, with a rigid and flexible Beige PVC fin weatherstripping on the interior of the panel bottom.
3. Sweep: on oak and handicap sill. Made of Beige santoprene.
4. Panel: Along bottom panel is a leaf-type weatherstrip made of rigid and flexible Beige PVC.
5. Stationary panel filler: made of Beige rigid and flexible PVC.
6. Stationary panel filler cover: made of rigid and flexible PVC, available in Beige.
7. Corner pad: handicap sills. Made of Gray pile.
8. Lock side corner pad: for optional oak sill. Made of gray closed cell foam.
9. Weatherstrip backer rod: made of Black PVC foam.

2.3 GLAZING

A. Glass:

1. Standard one-lite IG is 1" with tempered LoE2-270, argon filled. R-5 Triple Glazed.
2. Standard IG or single glazed has standard design pressure of 20 psf [DP 20].
3. High altitude IG has open breather tube.
4. All glass is select quality complying with FS-DD-G-451D.
5. IG complies with IGCC and ASTM E2190-08'.
 - a. For operating and fixed units, Standard Impact Resistant Laminated Glass is Lami 27 and 31.

B. Glazing Methods:

1. Operating units and fixed units have K-Glaze with 3/16 inch [5mm] wide glazing tape and primary silicone on Number1 surface along sight line paired with latex sealant on Number4 surface at wood glazing bead.
 - a. Impact glazed units are interior glazed using silicone and EPDM shims or tape glaze, with vinyl bracket secured with additional silicone. Wood glazing bead are mitered on the corners and fastened with brads.

C. Glass Options:

1. R-5 double glazed, installed by manufacturer.
2. Tempered glass.
3. Protective film.
4. Filled with argon gas.

D. Glazing Bead Options:

1. Beveled profile.

2.4 ACCESSORIES AND TRIM

A. Installation Accessories:

1. Galvanized steel installation clips [number required to meet DP20 may be factory applied to unit]. Units without exterior casing are shipped with a factory applied nailing fin.

2. Mull anchors.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING

- A. Deliver in original packaging, store in an upright position off the ground in a clean, dry area. Protect from weather and construction activities.
- B. Prime or seal wood surfaces, including surfaces to be concealed by wall construction if more than 30 days will expire between delivery and installation.

3.2 INSTALLATION

- A. Verify that openings are plumb and square and of proper dimension.
- B. Install doors according to manufacturer's installation instructions.

END OF SECTION 08 14 23.13

SECTION 08 14 73: SLIDING WOOD DOORS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all painted pocket flush solid core doors for interiors spaces of The Solar Homestead. Refer to door schedule in Construction Documents.

1.2 RELATED SECTIONS

- A. Section 08 71 00 - Door Hardware
- B. Section 09 91 23 - Interior Paint

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Masonite Co
1 North Dale Mabry Hwy
Suite 950
Tampa, FL 33809
Phone: 800-895-2723
www.masonite.com
 - 1. Available at Home Depot.
4750 South Boulevard
Charlotte, NC 28217
Phone: 800-466-3337
www.homedepot.com

2.2 PRODUCT

- A. Masonite Flush Pocket Door
 - 1. Model Number: 104280
 - 2. Location: Core Module
 - 3. Smooth finish, primed for painting
 - 4. Door height: 80"
 - 5. Thickness: 1-3/4"
 - 6. Solid core construction, birch veneer
 - 7. Laminated galvalume sheet on side facing the bathroom
 - 8. Grey Benjamin Moore paint on side facing the hallway

2.3 ACCESSORIES

- A. Door Hardware [Refer to Section 08 71 00 - Door Hardware]

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Install in accordance with the manufacturer's recommendations.

3.2 PROTECTION

- A. Protect products from damage and deterioration until the date of substantial completion.

SECTION 08 15 73: SLIDING PLASTIC DOORS

PART 1 - GENERAL**1.1 SUMMARY**

- A. This section includes all painted pocket flush solid core fiberglass doors for interiors spaces of The Solar Homestead. Refer to door schedule in Construction Documents.

1.2 RELATED SECTIONS

- A. Section 08 71 00 - Door Hardware

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. KSDAJFSJFLSJ

2.2 PRODUCTS

- A. Fiberglass Flush Pocket Door
 1. Model Number:
 2. Location: Core Module
 3. Smooth finish, primed for painting
 4. Door height: 84"
 5. Thickness: 1-3/4"
 6. Solid core construction of fiberglass

2.3 ACCESSORIES

- A. Door Hardware [Refer to Section 08 71 00 - Door Hardware]

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with the manufacturer's recommendations.

3.2 PROTECTION

A. Protect products from damage and deterioration until the date of Substantial Completion.

END OF SECTION 08 14 73

SECTION 08 43 13: ALUMINUM-FRAMED STOREFRONTS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the aluminum-framed storefront used in conjunction with the Trombe Wall [Refer to Section 23 71 00 - Thermal Storage] for The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 23 71 00 - Thermal Storage

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kawneer
555 Guthridge Court
Technology Park/Atlanta
Norcross, GA 30092
Phone: 771-449-5555
www.kawneer.com
 - 1. Available through Kawneer.

2.2 PRODUCTS

- A. Kawneer EnCORE Thermal Framing System
 - 1. Model Number: Custom
 - 2. Location: Living Module
 - 3. Dimensions [W x H]: 8' x 6'
 - 4. 1-3/4" sight line with a 3-9/16" depth
 - 5. Screw spline system
 - 6. Outside glazed
 - 7. Thermal break via polymer glazing clip

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify that openings are plumb and square and of proper dimension.
- B. Install in according with manufacturer's recommendations.

END OF SECTION 08 43 13

SECTION 08 52 13: METAL-CLAD WOOD WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes clad casement operating windows operating fixed picture complete with hardware, glazing, weatherstripping, screens, jamb extensions, and standard or specified anchorages, trim, attachments, and accessories.

1.2 REFERENCES

- A. Compliance with American Society for Testing and Materials [ASTM], Window and Door Manufacturers Association [AAMA/WDMA], American National Standards Institute/Window and Door Manufacturers Association [ANSI/WDMA], National Fenestration Rating Council [NFRC], WDMA Hallmark Program, Consumer Product Safety Commission [CPSC].

1.3 SYSTEM DESCRIPTION

A. Design and Performance Requirements

1. Standard Performance windows include residential application [design pressure required 50 psf].
2. Air, water, structural, and forced entry resistance shall be at levels which meet the specified design pressure as per AAMA/WDMA/CSA 101/I.S.2/A440-05', 101/I.S.2/A440-08'.
3. Unique, non-listed unit's performance, when not tested, may be addressed by a manufacturer's Statement of Qualification.
4. Mullion design can be adequate for specified design pressure.

B. Energy Ratings

1. All units tested are one-lite, residential, LoE2-270, argon filled, with Kolbe ID No. as listed on the NFRC label adhered to each unit. Values are certified per NFRC and units are labeled per state requirements.
2. Unique, non-listed units may have U & SHGC determined by NFRC procedures and listed on a manufacturer's.
3. R-5 glass panes installed by manufacturer.

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kolbe & Kolbe Millwork Co., Inc.

1323 S. 11th Ave

Wausau, WI 54401

Phone: 715-842-5666

www.kolbe-kolbe.com

1. Available through Kolbe & Kolbe Millwork Co., Inc. and national chain hardware stores.

2.2 PRODUCT

- A. Kolbe Window Frame: Constructed of kiln-dried pine, with pine interior stops and mull casings on mulled units, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A. Clad assembled frames have factory installed heavy vinyl nailing fins at head, side jambs and sill. Nailing fin at head has integral drip cap.
1. Jamb thickness: 1-1/8 inch [29mm] at the side jambs and 1 7/16" [37mm] at head.
 2. Basic jamb width: 2-3/4 inch [69mm].
 3. Standard overall jamb with extensions applied: 4-9/16 inch [116mm].
 4. Sill thickness: 1-7/16 inch [37mm].
 5. Exterior: All frame parts are .050 inch [1.3mm] thick 6063 extruded aluminum alloy with accessory grooves, press fit and fastened onto the wood frame. Optional Anodized Aluminum Clad Finish.
 6. Corner Construction: Mitered corners use internal corner key and sealer.
 7. Other wood species available: Pine [standard] on exposed wood frame components.
 8. Prep for stool.
- B. Kolbe Window Sash: Constructed of kiln dried pine, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A.
1. Thickness: 1-11/16 inch [43mm]
 2. Sash Width/Face Dimension: 2-1/4 inch [58mm].
 3. Exterior: Sash parts, segment head, 1/2 and 1/4 circle top sash exterior are completely covered by .050 inch [1.3mm] thick 6063 extruded aluminum alloy with corners coped and sealed on rectangular units and full radius units. Radius unit corners mitered on segment and quarter circle. Anodized Aluminum Clad Finish.
 4. Corner construction: mortise-and-tenon or butt.
 5. Other wood species available: Pine [standard]
 6. Interior glazed.
- C. Kolbe Surface Finish:
1. Exterior Finish – Aluminum
 - a. Aluminum Anodized: Exterior Components: Exterior aluminum frame and sash components are to have an anodized finish in compliance with AAMA 611-98 specifications. The anodized finish is to be clear.
 2. Interior Finish - Wood:
 - a. Interior wood is to be treated bare wood without stain or top coat.
- D. Hardware: All major exposed operating hardware to be stainless steel.
1. Operator: Factory installed dual arm, roto-gear style corrosion resistant with concealed heavy duty adjustable hinges. Slim series uses one dyad operator; segment head, 1/2 and 1/4 circle head venting units utilize a single arm operator and concealed Euro hinges made of chromate conversion finish over aluminum. [On certain rectangular sizes, concealed Euro hinges are needed to achieve emergency escape and rescue.] Corrosion resistant gears and drive worm. Exterior operator parts are coated with corrosion resistant materials.
 2. Operator Arms, Track and Adjustable Hinges: Made from corrosion resistant materials. Hinge track is made from corrosion resistant materials. Concealed Euro hinge made of chromate conversion finish over aluminum rectangular unit.
 3. Operator Handles: Folding handles are standard. T-handles. Material: Corrosion resistant. Finish: Baked enamel and plated. Color: Satin Nickel.

4. Operator Cover: Made of Polycarbonate. Color: Satin Nickel.
 5. Locking System: Single actuated multi-point lock[s] are standard. Standard, High and Impact performance tie bars are made of corrosion resistant materials. Tie bar has UV resistant acetyl rollers. Guides are gray acetal. Keepers are corrosion resistant.
 6. Lock Handle: Made of corrosion resistant materials. Color: Satin Nickel.
 7. Lock Escutcheon Color Options: Standard is Clay Satin Nickel.
 8. Concealed Snubbers: Made of Zamac Number3 plated with bright zinc coating.
 9. On Fixed Units and Transoms: Sill sash, head and sides use retainer clips.
- E. Weatherstripping: On all units.
1. Frame: Full perimeter Beige sponge EPDM with dense EPDM stem. Water cap at head and sill.
 2. Sash: Perimeter dual durometer polyolefin bulb with arloc slipcoat – Black.
- F. Screens: Factory installed on all operating units.
1. Screen cloth: Bright aluminum
 2. Screen Channels: .024 inch [0.6mm] thick roll formed aluminum.
 3. Attachment: Spring loaded plungers.
 4. Corner Construction and Finish Color: Screen channels in Clay are standard White. Channels are joined and reinforced with a corner key.

2.3 GLAZING

- A. Glass:
1. Standard one-lite IG is 7/8 inch [23mm] with LoE2-270, argon filled. R-5 Double Glazed.
 2. Standard IG or single glazed has standard design pressure of 50 psf [DP 50].
 3. High altitude IG has open breather tube.
 4. All glass is select quality complying with FS-DD-G-451D.
 5. IG complies with IGCC and ASTM E2190-08'.
 6. For operating casement units, Standard Impact Resistant Laminated Glass is Lami 11.
- B. Glazing Methods:
1. Operating units and fixed units have K-Glaze with 3/16 inch [5mm] wide glazing tape and primary silicone on Number1 surface along sight line paired with latex sealant on Number4 surface at wood glazing bead.
 2. High Performance option operating units and fixed units have silicone-glazed structural silicone bedding sealant on Number1 surface with a 0.5 inch [13mm] bite, and supplemental siliconized latex sealant on Number4 surface at wood glazing bead.
 3. Impact glazed units are interior glazed using silicone and EPDM shims or tape glaze, with vinyl bracket secured with additional silicone. Wood glazing bead are mitered on the corners and fastened with brads.
- C. Glass Options:
1. LoE3 366
 2. Tempered glass.

- 3. Protective film.
 - 4. With argon gas
 - D. Glazing Bead Options:
 - 1. Beveled profile.
- 2.4 ACCESSORIES AND TRIM
 - A. Installation Accessories:
 - 1. Galvanized steel installation clips [number required to meet DP20 may be factory applied to unit]. Units without exterior casing are shipped with a factory applied nailing fin.
 - 2. Mull anchors.
 - 3. Strip mull anchors.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING

- A. Deliver in original packaging, store in an upright position off the ground in a clean, dry area. Protect from weather and construction activities.
- B. Prime or seal wood surfaces, including surfaces to be concealed by wall construction if more than 30 days will expire between delivery and installation.

3.2 INSTALLATION

- A. Verify that openings are plumb and square and of proper dimension.
- B. Install in according with manufacturer's recommendations.

END OF SECTION 08 52 13

SECTION 08 63 00: METAL-FRAMED SKYLIGHTS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the custom metal-framed skylight located above the Core Module of the Main House.

1.2 SYSTEM DESCRIPTION

- A. Fixed curb-mount skylight that consists of five integrated components - an interior condensation drainage gasket, an insulating polycarbonate unit, exterior structural sealant, roll-formed aluminum frame counter flashing with ASA corner keys.
- B. The skylight unit shall be placed on top of the constructed, sloped-parapet with proper flashing in order to protect the Appalachian State University Solar Thermal Collector Bank below [Refer to Section 22 33 30.23 - Residential, Collector-To-Tank, Solar-Electric Domestic Water Heaters].

1.3 RELATED SECTIONS

- A. Section 22 33 30.23 - Residential, Collector-To-Tank, Solar-Electric Domestic Water Heaters

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Altuglas International
2000 Market Street
Philadelphia, PA 19103
Phone: 215-419-7000
www.plexiglas.com
 - 1. Available at Altuglas International, or other online plastic suppliers.

2.2 PRODUCTS

- A. Custom Metal-Framed Skylight
 - 1. Location: Core Module
 - 2. Dimensions [L x W x H]: 16' 3-1/2" x 8' 3" x 1.302" [4965.72 mm x 2514.61 mm x 33.08 mm]
 - 3. Aluminum Frame:
 - a. Dimensions [L x W x H]: 16' 3-1/2" x 8' 3" x 1-1/8" [4965.72 mm x 2514.61 mm x 28.58 mm]
 - b. Manufactured by Triplett & Coffey per the design of Appalachian State University students and faculty.
 - 4. Plexiglass SG Plus
 - a. Dimensions [L x W x D]: 16' 3-1/2" x 8' 3" x 0.177" [4965.72 mm x 2514.61 mm x 4.5 mm]
 - b. Color: colorless
 - c. Critical craze stress: 1600 psi

- d. Impact energy: 39 in/lbs

2.3 ACCESSORIES

- A. Field fasteners: [Skylight frame to curb] 1/2" x 2-1/2" stainless steel lag bolts

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. Clean exposed skylight according to manufacturer's written instructions. Touch up damage to metal coatings and finishes.
- B. Remove excess sealants, dirt, and other substances.
- C. During the construction process, protect the skylight surfaces from contact with contaminants.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Align skylight with curb, free of warp or twist, maintaining dimensional tolerances.

END OF SECTION 08 63 00

SECTION 08 71 00: DOOR HARDWARE**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes information on hardware sets for all doors within The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Interior and exterior door hardware sets. This includes hinges, sliders, pulls, tracks, and locksets.

1.3 RELATED SECTIONS

- A. Section 08 78 00 - Special Function Hardware
- B. Section 08 14 23.13 - Metal-Face Wood Doors

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Johnson Hardware
2100 Sterling Ave
Elkhart, IN 46516
Phone: 800-348-7616
www.johnsonhardware.com
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Stanley Hardware
480 Myrtle Street
New Britain, CT 06053
Phone: 800-622-4393
www.stanleyhardware.com
 - 1. Available at national chain hardware stores, such as Lowes.
- C. Gatehouse/Lowes
1000 Lowe's Blvd
 Mooresville, NC 28117
Phone: 704-758-1000
www.lowes.com
 - 1. Available at national chain hardware stores, such as Lowes.
- D. S & S Hinge Company

210 Covington Dr.
Bloomington, IL 60108-3105
Phone: 630-582-9500
www.sandshinge.com

1. Available through S & S Hinge Company.

E. 80/20 Inc
1701 South 400 East
Columbia City, IN 46725
Phone: 260-248-8030
www.8020.net

1. Available at national chain hardware stores, such as Lowes.

F. Contemporary Door Hardware
Phone: 954-850-1126
www.contemporary-door-hardware.com

1. Available through Contemporary Door Hardware.

G. Guden
99 Raynor Avenue
Ronkonkoma, NY 11779
Phone: 631-737-2900
www.guden.com

1. Available through Guden.

2.2 PRODUCTS

A. Refer to Construction Documents for locations of hardware sets.

| Hardware Set | Manufacturer | Product Name | Model Number | Finish |
|--------------|--|---------------------------------|--------------|-----------------------|
| A | Johnson | Pocket Door Frame | 203080PF | Brushed nickel plated |
| A | Stanley | Pocket Door Latch | V1951 | Satin nickel |
| B | Stanley | Square Corner Residential Hinge | 14 | Brushed nickel plated |
| B | Gatehouse | Ball Catch | 20482TNXLG | Stainless steel |
| C | S&S | Series 1300 | 1311 x 96 | Stainless steel |
| C | 80/20 | Magnetic Door Catch | - | - |
| C | Contemporary Door Hardware | Modern Flush Pull Sig | 720 | Stainless steel |
| D | *Stanley specialty order for Barn Door* [Refer to Section 08 78 00 - Special Function Hardware] | | | |
| E | *hardware/threshold included as part of Metal-Faced Wood Doors* [Refer to Section 08 14 23.13 - Metal-Faced Wood Doors] | | | |
| F | Guden | Continuous Hinges | 10090810-96 | Stainless Steel |

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer’s recommendations.

END OF SECTION 08 71 00

SECTION 08 78 00: SPECIAL FUNCTION HARDWARE**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes an industrial box track hardware that will be used for operation of the barn door in front of the Trombe wall system.

1.2 SYSTEM DESCRIPTION

- A. This system operates the barn door, which is located on The Solar Homestead's South Elevation of the Living Module. Refer to construction drawings for details.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Stanley Hardware
480 Myrtle Street
New Britain, CT 06053
Phone: 800-622-4393
www.stanleyhardware.com
- B. National Hardware
41 US Route #30
Rock Falls, IL 61071
Phone: 800-346-9445
www.natman.com
 - 1. Available at New River Building Supply.
3148 Hwy. 105 South
Boone, NC 28607
Phone: 828-264-5650
www.newriverbuilding.com

2.2 PRODUCTS

- A. Stanley Box Track Hanger
 - 1. Model Number: 411020
 - 2. Location: Living Module
 - 3. Finish: zinc plated [2C]
 - 4. Capacity: 450 lbs. maximum [225 lbs. per hanger]
- B. National Hardware Plain Box Rail 10'
 - 1. Model Number: 5114 N104-901

2. Location: Living Module
3. Dimensions [L]: 10' [3048 mm]
4. Finish: galvanized
5. Capacity: 600 lbs

C. National Hardware Plain Box Rail 12'

1. Model Number: 5114 N104-950
2. Location: Living Module
3. Dimensions [L]: 12' [3658 mm]
4. Finish: galvanized
5. Capacity: 600 lbs

2.3 ACCESSORIES

- A. 1/4" A307 Bolt

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations and Construction Documents.

END OF SECTION 08 78 00

SECTION 08 83 00: MIRRORS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the custom mirrors used in the bathrooms of The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. Custom Mirrors

1. 28" x 6" Custom Mirror
 - a. Location: Flex Bath
 - b. Dimensions [W x H x D]: 28" x 6" x 1/4"
2. 28" x 5' Custom Mirror
 - a. Location: Flex Bath
 - b. Dimensions [W x H x D]: 28" x 5' x 1/4"
3. 28" x 5' Custom Mirror
 - a. Location: Core Module Bath
 - b. Dimensions [W x H x D]: 28" x 25" x 1/4"

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all mirrors plumb, square, and true to line.

END OF SECTION 08 83 00

SECTION 09 29 00: GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes information on all types of gypsum sheathing used in The Solar Homestead. Gypsum wallboard is only used for ceilings and the cove in the Main House and the walls and ceilings in the Flex Space.

1.2 SYSTEM DESCRIPTION

- A. QuietRock Soundproof Drywall: Used for the "light" wall between the bedrooms of the Main House.

1.3 RELATED SECTIONS

- A. Section 01 25 13 - Product Substitution Procedures

1.2 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheets [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Georgia-Pacific LLC
133 Peachtree Street NE
Atlanta, GA 30303
Phone: 404-652-4000
www.gp.com
 - 1. Manufacturer specified or an equal product.
 - 2. Available at national chain hardware stores, such as Lowes.
- B. Serious Materials
1250 Elko Drive
Sunnyvale, CA 94089
Phone: 800-797-8159
www.quietrock.com; www.seriousmaterials.com
 - 1. Available through Serious Materials.

2.2 PRODUCTS

- A. Gypsum Wallboard
 - 1. 4' x 8' panels
 - 2. Thickness:
 - a. 5/8" for the wall cove detail in the Main House [CSI 09 29 00.D1]
 - b. 5/8" for the ceiling in the Flex OM and Main House [CSI 09 29 00.D1]

- c. 1/2" for the walls in the Flex OM [CSI 09 29 00.A3]
 - B. QuietRock Soundproof Drywall [CSI 09 29 00.C3]
 - 1. Model Number: 510
 - 2. Location: Bedroom Module
 - 3. Dimensions [L x W x D]: 9' x 4' x 1/2"
 - 4. Weight: 2.25 lbs/sq ft
 - 5. Materials: paper faced gypsum, sound-absorbing viscoelastic polymer core
- 2.3 ACCESSORIES
- A. QuietSeal for QuietRock Soundproof Drywall
 - 1. Color: yellow
 - 2. Weight: 14.1 lbs/gallon
 - 3. Layer thickness: 1/16"
 - 4. Drying time: remains soft
 - 5. Engageability: -10°F
 - 6. Storage temperature: 40-100°F, do not freeze
 - B. QuietPutty for QuietRock Soundproof Drywall
 - 1. Color: blue/green
 - 2. Weight: 6 oz/pad
 - 3. Size: 7" x 7"/pad
 - 4. Thickness: 1/8"
 - 5. Unit Size: 10 pads/box

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all gypsum wallboard plumb, square, and true to line.

END OF SECTION 09 29 00

SECTION 09 34 00: WATERPROOFING-MEMBRANE TILING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the waterproofing-membrane that will be applied beneath the floor of the shower in The Solar Homestead's Core Module Bath.

1.2 SYSTEM DESCRIPTION

- A. Schluter-KERDI: a bonded waterproof membrane with limited crack-bridging capabilities. It is made of soft polyethylene, which is covered on both sides with a special fleece webbing to anchor the membrane in the thin-set mortar.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Schluter Systems, LP
194 Pleasant Ridge Road
Plattsburgh, NY 12901
Phone: 800-472-4588
www.schluter.com
 - 1. Available at Mountain Tile and Stone.
1852 Highway 105 South
Boone, NC 28607
Phone: 828-265-0472
www.mountaintileandstone.com

2.2 PRODUCT

- A. Schluter-KERDI
 - 1. Model Number: KERDI 200/5M
 - 2. Location: Core Module Bath
 - 3. 8 mil thick
 - 4. Color: orange

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 09 34 00

SECTION 09 62 00: SPECIALTY FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes information on specialty flooring that will be on the floor, walls, and ceiling of bathroom in the Core Module. Locust is also used for a custom bathroom vanity [Refer to Section 06 20 23 - Interior Finish Carpentry].

1.2 RELATED SECTIONS

- A. Section 06 20 23 - Interior Finish Carpentry
- B. Section 09 93 13.13 - Exterior Staining

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Available at national chain lumber stores and online Locust decking websites.

2.2 PRODUCT

- A. Black Locust Wood
 - 1. Location: Core Module Bath
 - 2. 1x6 wood flooring
 - 3. Natural white vinegar stain and protective clear coat [Refer to Section 09 93 13.13 - Exterior Staining]
 - 4. Family name: Robinia Pseudoacacia
 - 5. Growing location: native in the United States from Pennsylvania to northern Georgia
 - 6. Height/diameter: range from 40 to 60 feet high, trunk reaches 1-2 feet in diameter
 - 7. Dimensional stability: high density
 - 8. Strength: 12% moisture content
 - 9. Weight: 48.2 lb/ft³
 - 10. Drying: use a mild kiln schedule
 - 11. Shrinkage: total volumetric shrinkage is 10.2%, once dry wood maintains stability
 - 12. High resistance to insects & decay

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

- A. Use a reduced cutting angle, keep edges sharp, and always predrill for nails or screws. Have numerous extra drill bits handy. Locust planks do not bend well, but the wood finishes and sands quite smoothly, with no splintering.

3.2 INSTALLATION

- A. Condition flooring in installation areas for 24 hours before installing.

- B. Install flooring level, plumb, true, and aligned with adjacent materials. Scribe and cut to fit adjoining work. Refinish and seal cuts.
- C. Select and arrange paneling for best match of adjacent units. Install with uniform tight joints.

END OF SECTION 09 62 00

SECTION 09 64 29: WOOD STRIP AND PLANK FLOORING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the hardwood flooring for throughout The Solar Homestead. Refer to Construction Documents for extent of floor finish.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available at national chain lumberyards and online hardwood floor stores.

2.2 PRODUCT

- A. Hardwood Strip Flooring
 - 1. 5" solid oak hardwood flooring
 - 2. Location: Main House
 - 3. Dimensions [L x W]: 84" x 5"
 - 4. 3/4" thickness for the floors with clear polyurethane finish
 - 5. 3/8" thickness for the floor cove with clear polyurethane finish
 - 6. 15 year warranty

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with the manufacturer's recommendations.
- B. Install with hidden finish nails.

3.2 PROTECTION

- A. Protect products from damage and deterioration until the date of Substantial Completion.

END OF SECTION 09 64 29

SECTION 09 74 13: WOOD WALL COVERINGS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the lauan plywood will be used for the interior walls of The Solar Homestead and the perforated hardboard that will be the interior finish of the OM Closets.

1.2 RELATED SECTIONS

- A. Section 09 91 23 - Interior Painting

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. Lauan plywood

1. Location: interior walls of Main House
2. Dimensions [L x W x D]: 8' x 4' x 1/4" [6.35 mm]
3. Paint: Glidden ruffle feathers [Refer to Section 09 91 23 - Interior Painting]
4. 150 flame spread

B. Perforated Hardboard [Peg Board]

1. Location: interior walls of the OM Closets
2. Dimensions [L x W x D]: 4' x 2' x 1/4" [6.25 mm]
3. Finish: white laminate
4. Material: hardboard and chipboard
5. Use 1/4" peg accessories

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations and Construction Documents.

END OF SECTION 09 74 13

SECTION 09 91 23: INTERIOR PAINT**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the paint that will be on the interior walls of The Solar Homestead. Refer to Construction Documents for paint schedule.

1.2 RELATED SECTIONS

- A. Section 08 14 73 - Sliding Wood Doors
- B. Section 09 74 13 - Wood Wall Coverings

1.3 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. ICI Paints
26th Floor Portland House
Bressenden Place, London
SW1E 5BG
England
www.icipaints.com
 - 1. Available through Boone Paint & Interiors
1852 Highway 105
Boone, NC 28607
Phone: 828-264-9220
www.boonepaint.com
- B. Benjamin Moore & Co.
101 Paragon Dr.
Montvale, NJ 07645
Phone: 800-344-0400
www.benjaminmoore.com
 - 1. Available through Boone Paint & Interiors
1852 Highway 105
Boone, NC 28607
Phone: 828-264-9220

www.boonepaint.com

C. Glidden Paint

607 South Lafayette St

Shelby, NC 28150

Phone: 704-406-9566

www.glidden.com

1. Available through Boone Paint & Interiors

1852 Highway 105

Boone, NC 28607

Phone: 828-264-9220

www.boonepaint.com

2.2. PRODUCT

A. ICI Prep & Prime

1. Model Number: 1020-1200

2. Location: Main House and Flex Space interior walls

3. Color: white

4. 34% solids

B. Benjamin Moore Interior Latex Paint

1. Model Number: W626 4X

2. Location: Core Module walls and Bedroom Closet doors

3. Finish: eggshell

4. Color: gray

5. 35% solids

C. Glidden Ultra-Hide 150 Interior Eggshell Paint

1. Model Number: 1412

2. Location: Main House ceiling and walls

a. Color: ruffled feathers

3. Location: Flex Space

a. Color: white tint base

4. Finish: eggshell

5. 32% solids

PART 3 - EXECUTION

3.1 PREPERATION

- A. Each surface due to be painted will first be primed and sanded twice before the paint is applied.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's recommendations and Construction Documents.

END OF SECTION 09 91 23

SECTION 09 93 13.13: EXTERIOR STAINING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the stain that will be used for the exterior sheathing of The Solar Homestead. Refer to Construction Documents for stain schedule.

1.2 RELATED SECTIONS

- A. Section 06 11 00 - Wood Framing
- B. Section 06 16 00 - Sheathing
- C. Section 06 20 23 - Interior Finish Carpentry
- D. Section 07 46 23 - Wood Siding
- E. Section 09 62 00 - Specialty Flooring

1.3 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Zar Deck & Siding Stain
United Gilsonite Laboratories
P.O. Box 70
Scranton, PA 18501
Phone: 800-845-5227
www.ugl.com
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Superdeck Duckback Products
2644 Hegan Lane
Chico, CA 95927
Phone: 800-825-5382
www.superdeck.com
 - 1. Available through Boone Paint & Interiors.
1852 Highway 105
Boone, NC 28607
Phone: 828-264-9220
www.boonepaint.com

- C. Benjamin Moore & Co.
 - 101 Paragon Drive
 - Montvale, NJ 07645
 - Phone: 888-236-6667
 - www.benjaminmoore.com
 - 1. Available through Boone Paint & Interiors.
 - 1852 Highway 105
 - Boone, NC 28607
 - Phone: 828-264-9220
 - www.boonepaint.com

2.2 PRODUCTS

- A. Zar Exterior Stain
 - 1. Model Number: 812
 - 2. Location: Main House exterior siding
 - 3. Finish: dark tint base matched to mark twain gray brick
- B. Superdeck Pressure Treated Wood Stain
 - 1. Model Number: DB 2001
 - 2. Location: Great Porch, Deck, Ramps, pressure-treated wood lumber
 - 3. Finish: cedar
 - 4. Density: 7.14 lbs/gal
 - 5. 60% solids
- C. Benjamin Moore Arborcoat Waterborne Exterior Stain
 - 1. Model Number: 636 00
 - 2. Location: Great Porch Canopy and columns, interior floors, interior door trim
 - 3. Finish: clear coat
 - 4. 25% solids

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 09 93 13.13

SECTION 10 11 46: VISUAL DISPLAY FABRICS**PART 1 - GENERAL**

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes all materials for the detachable movie screen used for the movie night competition.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Dazian
18 Central Blvd.
S. Hackensack, NJ 07606
Phone: 877-232-9426
www.dazian.com
- 1. Available through Dazian.

2.2 PRODUCTS

- A. Dazian Eco-Trapeze
 - 1. Model Number: N143753
 - 2. Location: Living Module
 - 3. Width: 120 in
 - 4. Weight: 19.60 oz (linear), 5.8 oz (square)
 - 5. Finish: white
 - 6. Fabric content: 90% recycled polyester and 10% Lycra
 - 7. Permanently flame resistant, meets NFPA 701 Small Scale

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 10 11 46

SECTION 10 28 00: TOILET, BATH, AND LAUNDRY ACCESSORIES**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all bathroom accessories used throughout The Solar Homestead.

1.2 SUBMITTAL

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. IKEA

8300 IKEA Blvd

Charlotte, NC 28262

Phone: 704-549-4532

www.ikea.com

- 1. Available through IKEA

B. Gatco

1550 Factor Avenue

San Leandro, CA 94577

Phone: 510-895-5676

www.gatco-inc.com

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. IKEA Grundtal Toilet Roll Holder [CSI 10 28 00.A2]

- 1. Model Number: 200.478.98
- 2. Location: Main House and Flex Bath
- 3. Dimensions [L x W x H]: 7 1/8" x 4 3/4" x 1 5/8"
- 4. Finish: stainless steel

B. IKEA Sävern Robe Hook [CSI 10 28 00.A9]

- 1. Model Number: 001.626.67
- 2. Location: Core Module Bath
- 3. Finish: chrome

C. Gatco Latitude 2 Satin Nickel Towel Bar [CSI 10 28 00.B2]

- 1. Model Number: 4291

2. Location: Core Module Bath
3. Dimensions [L x W x H]: 20.75" x 3.1" x 2"
4. Weight: 10 lbs
5. Finish: satin nickel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 10 28 00

SECTION 10 40 00: SAFETY SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes safety specialties used during the construction phase to protect workers working on the roof.

1.2 SYSTEM DESCRIPTION

- A. Anchorage connector to be used as part of a personal fall arrest system [PFAS].
 - 1. Includes integral baseplate, post, and D-ring anchor. The D-ring anchor is designed for attachment of a self-retracting lifeline [SRL], lanyard, or a lifeline. When subjected to fall arrest forces, the post will tip over to reduce uplifting loads on the roof decking.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Guardian Fall Protection
26609 79th Avenue South
Kent, WA 98032
Phone: 614-846-2525
www.guardianfall.com
 - 1. Available through Guardian Fall Protection.

2.2 PRODUCT

- A. Guardian CB-12 Roof Anchor
 - 1. Model Number: 00645
 - 2. Location: roof of the Main House and OM Closets
 - 3. Dimensions [L x W x H]: 16" x 16" x 12"
 - 4. Finish: galvanized
- B. Guardian Forged Anchorage Connector
 - 1. Model Number: 00370
 - 2. Location: Great Porch Canopy
 - 3. 5/8" hole

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 10 40 00

SECTION 11 28 13: COMPUTERS

PART 1 - GENERAL

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes the computer used for the home entertainment contest of the competition, in which it shall be operated during specific periods of time.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Toshiba America Information Systems, Inc.
9740 Irvine Boulevard
Irvine, CA 92618-1697
Phone: 949-583-3000
www.us.toshiba.com
 - 1. Available through Toshiba and national chain retail stores, such as Wal-Mart.

2.2 PRODUCT

- A. Toshiba Laptop
 - 1. Model Name: L670D-ST2N04
 - 2. Location: Main House
 - 3. Dimensions [W x H x D]: 16-1/4" x 10-1/2" x 1-1/2"
 - 4. Weight: 6.61 lbs
 - 5. 17.3" diagonal widescreen
 - 6. Operating system: Windows® 7 Home Premium 64-bit
 - 7. Processor: AMDTurion™ II Dual Core P560 2.5 GHz, 2MB L2 Cache
 - 8. Memory: configured with 4GB DDR3 1066MHz [max 8GB]
 - 9. Storage: 500GB [5400 RPM]; Serial ATA hard disk drive
 - 10. Graphics: AMD M880G Chipset with ATI Mobility Radeon™ HD 4250 with 256MB-1917MB dynamically allocated shared graphics memory
 - 11. Wattage: 65W
 - 12. Voltage: 100-240V/50-60Hz AC Adapter

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Supply computer for use in The Solar Homestead for contest purposes.

END OF SECTION 11 28 13

SECTION 11 31 13: RESIDENTIAL KITCHEN APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all kitchen appliances in The Solar Homestead to be used during the competition.

1.2 SYSTEM DESCRIPTION

- A. These appliances will be used for both the appliance and entertainment contests. The dishwasher will need to perform one cycle uninterrupted and reach a peak temperature of 120°F or 48.9°C. The stovetop and oven will need to complete the dining and cooking contest, which includes preparing two meals, snacks for movie night, and evaporating five pounds of water. The refrigerator will need to maintain a temperature within 34°F (1.11°C) and 40°F (4.44°C) and a range within -20°F (-28.9°C) and 5°F (-1.5°C) for the freezer.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. LG

1000 Sylvan Avenue

Englewood Cliffs, NJ 07632

Phone: 800-243-0000

www.lg.com

1. Available at national appliance stores, such as Best Buy.

B. Bosch

5551 McFadden Avenue

Huntington Beach, CA 92649

Phone: 800-944-2904

www.bosch-home.com

1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. LG 3-Door French Door Refrigerator [CSI 11 31 13.A1]

1. Model Number: LFC21776ST
2. Location: Living Module
3. Dimensions [W x H x D]: 35.75" x 69.75" x 30"
4. Weight: 278 lbs
5. Finish: stainless steel

6. Refrigerator capacity: 14.7 cu. ft.
 7. Freezer capacity: 6.0 cu. ft.
 8. Wattage: 1,100 W
 9. Voltage: 120 V
 10. Current: 15 A
- B. Bosch Induction Cooktop with Touch Control [CSI 11 31 13.A2]
1. Model Number: NIT3065UC
 2. Location: Living Module
 3. Dimensions [L x W x D]: 21-1/4" x 31" x 4-1/8"
 4. Finish: stainless steel
 5. Minimum distance from counter front: 2-1/4"
 6. Minimum distance from rear wall: 2"
 7. Wattage: 7200 W
 8. Voltage: 240 V
 9. Current: 40 A
- C. Bosch 30" Wall Mount Chimney Hood [CSI 11 31 13.A4]
1. Model Number: DKE9605PUC
 2. Location: Living Module
 3. Dimensions: 28-1/8" x 43-5/16"/31-3/4" x 46-13/16" x 30" x 20-7/16"
 4. Finish: stainless steel
 5. Motor location: installed in flue
 6. Air delivery CFM 600
 7. Plug type: 120 V – 3 prong
 8. Wattage: 620 W [580 W for vent] [40 W for lamp]
 9. Voltage: 110 V
 10. Current: 5.3 A
- D. Bosch 30" Single Wall Oven [CSI 11 31 13.A5]
1. Model Number: HBL3350UC
 2. Location: Living Module
 3. Dimensions [H x W x D]: 29-1/16" x 29-3/4" x 23-7/8"
 4. Finish: stainless steel
 5. Oven cavity 4.7 cu. ft.
 6. Electric bake element: 2,000 Watts
 7. Eight-pass broil element: 3,600 Watts

8. Voltage: 240/208 V
 9. Current: 30/25 A
 10. Frequency: 60 Hz
- E. Bosch Built-In Dishwasher [CSI 11 31 13.A7]
1. Model Number: SHX4AP05UC
 2. Location: Living Module
 3. Dimensions [H x W x D]: 33.875" x 23.5625" x 24.0625"
 4. Weight: 99 lbs.
 5. Finish: stainless steel
 6. Capacity: 14 place settings
 7. Wattage: 1400 W
 8. Voltage: 120 V
 9. Current: 12 A

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 11 31 13

SECTION 11 31 23: RESIDENTIAL LAUNDRY APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the washer and dryer used for The Solar Decathlon contests.

1.2 SYSTEM DESCRIPTION

- A. These appliances will be used for the appliance portion of the contest. The clothes washer will need to perform one load of laundry within a specified period of time. The clothes dryer will be used in combination with passive drying methods to dry a load of laundry to a total weight less than or equal to the load's total weight prior to washing. This portion of the contest will take place during several days of the contest for a total of two loads at a time.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Bosch
 - 5551 McFadden Avenue
 - Huntington Beach, CA 92649
 - Phone: 800-944-2904
 - www.bosch-home.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Bosch Clothes Washer
 - 1. Model Number: WAS24460UC
 - 2. Location: Laundry Closet
 - 3. Dimensions [H x W x D]: 33" x 23-3/5" x 23-1/5"
 - 4. Wattage: 2,300 W
 - 5. Voltage: 208-240 V
 - 6. Current: 12 A
 - 7. Frequency: 60 Hz
- B. Bosch Clothes Dryer
 - 1. Model Number: WTE86300US
 - 2. Location: Laundry Closet
 - 3. Dimensions [H x W x D]: 33-3/16" x 23-9/16" x 24-5/8"
 - 4. Plug type: 240 V - 4 prong

- 5. Wattage: 2,800 W
- 6. Voltage: 240/208 V
- 7. Current: 13 A
- 8. Frequency: 60 Hz

2.3 PRODUCTS

- A. Bosch Stacking Kit
 - 1. Model Number: WTZ1600
 - 2. Location: Laundry Closet

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Stacked washer and dryer with dryer on top.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 11 31 23

SECTION 11 52 00: AUDIO-VISUAL EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes the audio-visual equipment necessary for the movie night contest part of the competition.

1.2 SYSTEM DESCRIPTION

- A. This equipment will be used for the entertainment contest. A portion of the entertainment contest will involve operating the television during specified time periods. For movie night, the projector will be used to show the movie on the roll-up movie screen.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Mitsubishi Electric
9351 Jeronimo Road
Irvine, CA 92618
Phone: 888-307-0312
www.mitsubishielectric.com
 - 1. Available through Amazon.
1200 12th Avenue S
Suite 1200
Seattle, WA 98144
Phone: 866-216-1072
www.amazon.com
- A. LG
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
Phone: 800-243-0000
www.lg.com
 - 1. Available at national appliance stores, such as Best Buy.
- B. Samsung
85 Challenger Road

Ridgefield Park, NJ 07660

Phone: 800-726-7864

www.samsung.com/us

1. Available at national electronic stores, such as Best Buy.

C. Sony Corporation of America

550 Madison Ave.

New York, NY 10022

Phone: 888-476-6972

www.sony.com

1. Available at national electronic stores, such as Best Buy.

2.2 PRODUCTS

A. Mitsubishi DLP Projector

1. Model Number: HC4000

2. Location: Living Module

3. Dimensions [H x W x D]: 5-1/8" x 13-1/2" x 10-1/2"

4. Weight: 7.7 lbs

5. Resolution [native format]: 1920 x 1080

6. Lumens [brightness]: 1300 ANSI lumens

7. Maximum resolution: 1920 x 1200

8. Zoom factor: 1.5 x

9. Native aspect ratio: 16:9

10. Contrast ratio: 4000:1

11. Projection method: front, ceiling, rear

12. Lamp life: 5000 hours

B. LG LCD 37" HDTV

1. Model Number: 37LK450

2. Location: Living Module

3. Dimensions [W x H x D]: 35-7/8" x 22-1/2" x 3"

4. Weight: 24.5 lbs

5. Resolution [native format]: 1920 x 1080p

6. Contrast ratio: 100,000:1

7. Energy star qualified

8. Wattage: 150 W

9. Voltage: 100-240V, 50/60 Hz

- C. Samsung Soundbar Speaker
 - 1. Model Number: HW-C450
 - 2. Location: Living Module
 - 3. Dimensions [W x H x D]: 37-1/2" x 1-3/4" x 3-3/4"
 - 4. Number of channels: 2.1
 - 5. Audio processing: Dolby Digital, DTS
 - 6. Subwoofer: active wireless
 - 7. Wattage: 280 W
- D. Sony DVD Player
 - 1. Model Number: DVP-SR200P
 - 2. Location: Living Module
 - 3. Dimensions [W x H x D]: 12-1/2" x 1-1/4" x 8-1/4"
 - 4. Weight: 2.65 lbs
 - 5. Wattage: 9 W
 - 6. Voltage: 120 V
 - 7. Frequency: 60 Hz
- E. Sony PlayStation 3
 - 1. Model Number: CECH 2501A
 - 2. Location: Living Module
 - 3. Dimensions [W x H x D]: 11-1/2" x 2-1/2" x 11-1/2"
 - 4. Weight: 6.6 lbs
 - 5. Wattage: 250 W
 - 6. Voltage: 120 Vac
 - 7. Frequency: 60 Hz

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 11 52 00

SECTION 12 35 30.13: KITCHEN CASEWORK**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all casework for the bathroom and kitchen, as well as the kitchen accessories. Refer to cabinet schedule in Construction Documents.

1.2 SUBMITTALS

- A. Shop Drawings
- B. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. IKEA
8300 IKEA Blvd.
Charlotte, NC 28262
Phone: 704-549-4532
www.ikea.com
 - 1. Available through IKEA.

2.2 PRODUCTS

- A. IKEA Akurum Base Cabinets
 - 1. 30" Sink Cabinet
 - a. Model Number: 798.705.00
 - b. Location: Living Module
 - c. Dimensions [W x H x D]: 29-7/8" x 30-3/8" x 24-3/4"
 - d. Finish: stainless steel
 - 2. 15" Base Cabinet
 - a. Model Number: 798.706.37
 - b. Location: Living Module
 - c. Dimensions [W x H x D]: 14-7/8" x 30-3/8" x 24-3/4"
 - d. Finish: stainless steel
 - 3. Oven Base
 - a. Model Number: 298.459.28
 - b. Location: Living Module
 - c. Dimensions [W x H x D]: 24" x 30-3/8" x 24-3/4"

- d. Finish: stainless steel
- 4. High Cabinet with Pull-Out Storage – 2 doors
 - a. Model Number: 898.636.98
 - b. Location: Living Module
 - c. Dimensions [W x H x D]: 15" x 88" x 24-3/4"
 - d. Finish: stainless steel

2.3 ACCESSORIES

- A. IKEA Rubrik Pantry Cover Panel
 - 1. Model Number: 101.418.44
 - 2. Location: Living Module
 - 3. Finish: stainless steel
- B. IKEA Grundtal Wall Shelf
 - 1. Model Number: 000.114.28
 - 2. Location: Living Module
 - 3. Dimensions [L x W x H]: 9-3/4" x 2-1/2" x 1/2"
- C. IKEA Grip Handle
 - 1. Model Number: 700.919.78
 - 2. Location: Living Module
 - 3. Finish: aluminum
- D. IKEA Perfekt Plinth
 - 1. Model Number: 001.451.97
 - 2. Location: Living Module
 - 3. Dimensions [L x H x D]: 88" x 4-1/4" x 5/8"
 - 4. Finish: stainless steel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install into wall with concealed fasteners, typical.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 12 35 30.13

SECTION 12 35 30.23: BATHROOM CASEWORK**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the bathroom casework for the Flex OM.

1.2 SYSTEM DESCRIPTION

- A. IKEA product as a unit with company sink and faucet included.

1.3 RELATED SECTIONS

- A. Section 22 41 16 - Residential Lavatories and Sinks
- B. Section 22 33 13 - Instantaneous Electric Domestic Hot Water Heaters

1.4 SUBMITTAL

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. IKEA
 - 8300 IKEA Blvd
 - Charlotte, NC 28262
 - Phone: 704-549-4532
 - www.ikea.com
 - 1. Available through IKEA.

2.2 PRODUCTS

- A. IKEA Vanity
 - 1. Model Number: 498.941.97
 - 2. Location: Flex Bath
 - 3. Dimensions [W x H x D]: 31-1/2" x 36-1/4" x 16-1/8"
 - 4. Finish: white
 - 5. IKEA sink included

2.3 ACCESSORIES

- A. Instantaneous Hot Water Heater [Refer to Section 22 33 13]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 12 35 30.23

SECTION 12 36 19: WOOD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all wood countertops used in the Living Module and the Outdoor Kitchen. This product is also used for the backsplash and kitchen surround.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Butcher Block Co.
PO Box 17446
Seattle, WA 98127
Phone: 877-845-5597
www.butcherblockco.com
 1. Available through Lumber Liquidator.
495 Watson Road
Arden, NC 28704
Phone: 828-483-4189
www.lumberliquidators.com

2.2 PRODUCTS

- A. Williamsburg Butcher Block
 1. Model Number: 10012578
 2. Location: Living Module, Outdoor Kitchen
 3. Dimensions [L x W x D]
 1. Counter: 9'-8" x 2'-2" x 1-1/2"
 2. Backsplash: 9'-8" x 2'-2-1/2" x 3/4"
 3. Ceiling: 9'-8" x 24-1/2" x 1-1/2"
 4. North Wall: 4'-9" x 24-1/4" x 1-1/2"
 5. South Wall: 4' x 24-1/2" x 1-1/2"
 6. Flex OM: 4'-11" x 1'-2" x -1/2"
 4. Finish: maple

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 12 36 19

SECTION 13 34 19: METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all metal trailers fabricated for The Solar Homestead. Refer to Construction Documents for details on the manufactured custom steel trailers as specified and detailed by the Structural Engineer.

1.2 RELATED SECTIONS

- A. Section 06 05 23 - Wood, Plastic, and Composite Fastenings
- B. Section 06 11 00 - Wood Framing
- C. Section 06 80 00 - Composite Fabrications

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Kraftsman Trailers
10051 US Hwy 64E
Ramseur, NC 27316
Phone: 866-890-1918
 1. Available through Kraftsman Trailers.
- B. BAL R.V. Products Group
2600 Jeanwood Drive
Elkhart, IN 46514
Phone: 800-347-2232
www.norcoind.com
 1. Available at tjtrailers.com, pplmotorhomes.com, and other online trailer websites.

2.2 PRODUCTS

- A. Manufactured Custom Steel Trailers [CSI 13 34 19.A1]
 1. Custom-designed road-safe steel trailers with brake lights as required by law.
 2. Refer to details in Construction Drawings.
 3. House Trailers
 - a. Dimensions [L x W]: 23 3-1/2" x 11' 11"
 4. Flex OM Trailer
 - a. Dimensions [L x W]: 12' x 25' 10-1/4"
 5. OM Trailers
 - a. Dimensions [L x W]: 15'-9" x 7'-9"

2.3 ACCESSORIES

- A. BAL Leveling Scissor Jack [CSI 13 34 19.A2]
 - 1. Model Number: BAL-24SJ
 - 2. Jack to be welded to underside of manufactured custom steel trailers as specified and detailed by the Structural Engineer. Refer to Construction Documents for details.
 - 3. Maximum lift capacity: 7,500 lbs.
 - 4. Extended height: 23-3/4"
 - 5. Retracted height: 4"

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

- A. Contract in accordance with all Construction Drawings as detailed by the Structural Engineer.

END OF SECTION 13 34 19

SECTION 21 05 19: METERS AND GAGES FOR FIRE-SUPPRESSION SYSTEMS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all meters and gages for the water-based fire-suppression system used in The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 21 10 00 - Water-Based Fire-Suppression Systems

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Potter Electric Signal Company, LLC

2081 Craig Rd

St. Louis, MO 63146

Phone: 800-325-4161

www.pottersignal.com

1. Available through Ferguson Fire and Fabrication.

2750 South Towne Avenue

Pomona, CA 91766

Phone: 909-517-3085

www.fergusonfire.com

- B. ProPlumber, PHAC, Inc.

722 1st Street

Lyndhurst, NJ 07071

Phone: 201-933-1331

www.proplumber.net

1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Potter Waterflow Alarm Switch [CSI 21 05 19.A1]

1. Model Number: VSR-S

2. Location: Main House Mechanical Closet, Outdoor Kitchen Mechanical Closet

3. Dimensions [L x W x H]: 5-1/2" x 3-1/2" x 2-3/8" [141.2 mm x 89 mm x 59.4 mm]

4. Finish: die-cast, red enamel

5. Service Pressure: 300 psi maximum [20.7 bar]

6. Maximum surge: 18 fps [5.5 m/s]
 7. Flow sensitivity range for signal: 4-10 gpm [15-38 lpm]
- B. ProPlumber Pressure Gauge [CSI 21 05 19.B1]
1. Model Number: PP100G
 2. Location: Main House Mechanical Closet, Outdoor Kitchen Mechanical Closet
 3. Dimensions [Diameter]: 1" [25.4 mm]
 4. Finish: steel
 5. Maximum rated pressure: 100 psi

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 21 05 19

SECTION 21 10 00: WATER-BASED FIRE-SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the water-based fire-suppression system used in The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. This system uses a non-coded, hardwired, zoned and battery back-up smoke detectors coupled with a fire-suppression system utilizing sprinkler heads. The sprinkler heads and smoke detectors work independently of one another.

1.3 SUBMITTALS TO AUTHORITIES HAVING JURISDICTION

- A. Submittal to Boone, NC Fire Department for code approval.

1.4 UL LISTED AND LABELED

- A. All electrical components of fire suppression and detection system are listed and labeled as defined as pursuant to the NFPA 70, by a qualified testing agency and located as determined by design.

1.5 RELATED SECTIONS

- A. Section 21 05 19 - Meters and Gages for Fire-Suppression Systems
- B. Section 21 16 00 - Fire-Suppression Pressure Maintenance Pumps
- C. Section 22 11 16 - Domestic Water Piping
- D. Section 28 31 00 - Fire Detection and Alarm

1.6 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Victaulic
4901 Kesslersville Road
Easton, PA 18040
Phone: 800-742-5842
www.victaulic.com
 - 1. Available through Victaulic.
- B. The Viking Corporation
210 North Industrial Park Drive
Hastings, MI 49058
Phone: 800-968-9501
www.vikinggroupinc.com
 - 1. Available through The Viking Corporation.

C. NIBCO
1516 Middlebury Street
PO Box 1167
Elkhart, IN 46515-1167
Phone: 800-234-0227
www.nibco.com

A. Available through NIBCO.

2.2 PRODUCTS

A. Victaulic Residential Horizontal Sidewall Sprinkler

1. Model Number: V2738 [CSI 21 10 00.A1]
 - a. Location: Flex Space, Bedroom Module, Main House Mechanical Closet, Laundry Closet
 - b. Finish: white
 - c. K-factor: K4.2 - 6.1
 - d. Thread size: 1/2" [15 mm]
 - e. UL pressure: 175 psi [1200 kPa]
 - f. Sprinkler temperature range: 155°F - 175°F [68°C - 79°C]
2. Model Number: V2744 [CSI 21 10 00.A2]
 - a. Location: Living Module
 - b. Finish: white
 - c. K-factor: K5.6 - 8.1
 - d. Thread size: 1/2" [15 mm]
 - e. UL pressure: 175 psi [1200 kPa]
 - f. Sprinkler temperature range: 155°F - 175°F [68°C - 79°C]

B. Victaulic Residential Concealed Pendent Sprinkler [CSI 21 10 00.A3]

1. Model Number: V2734
2. Locations: Hallways, Bedroom Closets
3. Finish: white
4. K-factor: K4.9 – 7.1
5. Thread size: 1/2" [15 mm]
6. UL pressure: 175 psi [1200 kPa]
7. Sprinkler temperature range: 155°F - 175°F [68°C - 79°C]

C. Viking BlazeMaster 3/4" CPVC Piping [CSI 21 10 00.B1]

1. Model Number: 34 PIPE
2. Dimensions [Diameter x L]: 3/4" x 15' [19mm x 4.6 m]

3. Weight: 2.52 lbs/15' [1.14 kg/4.6 m]
4. Meets NFPA 13R and 13D standards for residential occupancies as well as NFPA 13 standards for light hazard occupancies.
5. Pipe meets or exceeds ASTM F442.

2.3 ACCESSORIES

- A. NIBCO BlazeMaster CPVC Fittings [CSI 21 10 00.B2]
 1. 3/4" x 1/2" BASTIC Sprinkler Head Adapters
 - a. Model Number: 5003-S-BT
 - b. Location: throughout The Solar Homestead
 - c. Weight: 0.16 lbs [73 g]
 - d. Joint: SXFNPT
 2. 3/4" 5011 Tees
 - a. Model Number: 5011
 - b. Location: throughout The Solar Homestead
 - c. Weight: 0.10 lbs [45 g]
 - d. Joint: SXSXS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The fire-suppression and detection systems will be installed pursuant to NFPA 13d regulations. The system has been oversized to ensure proper protection.
- B. The water storage for fire-suppression will be tied in to freshwater storage for home.
- C. The system shall be designed and stamped by Elm Engineering.

END OF SECTION 21 10 00

SECTION 21 16 00: FIRE-SUPPRESSION PRESSURE MAINTENANCE PUMPS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the pressure maintenance pump for the fire-suppression system.

1.2 RELATED SECTIONS

- A. Section 21 10 00 - Water-Based Fire-Suppression Systems
- B. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Grundfos Pumps Corporation
17100 West 118th Terrace
Olathe, KS 66061
Phone: 913-227-3400
www.grundfos.com
 - 1. Available through Murray Supply Company.
1084 6th Street Court SE
Hickory, NC 28609
Phone: 828-431-4636
www.murraysupply.com

2.2 PRODUCTS

- A. Grundfos 2 Horsepower Pump
 - 1. Model Number: JPF7A
 - 2. Location: underneath Outdoor Shower
 - 3. Dimensions [L x W x D]: 25-1/2" x 12-1/2" x 10"
 - 4. Finish: cast iron
 - 5. Flow range: 2.6-35 gpm
 - 6. Maximum working pressure: 110 psi
 - 7. Wattage: 2.40 kW
 - 8. Voltage: 230 V
 - 9. Current: 11 A

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 21 16 00

SECTION 22 05 19: METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all meters and gages used for the plumbing of The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping
- B. Section 22 33 30.23 - Residential, Collector-to-Tank, Solar-Electric Domestic Water Heaters

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. McMaster-Carr
200 Aurora Industrial Pkwy
Aurora, OH 44202
Phone: 330-995-5500
www.mcmaster.com
 - 1. Available through McMaster-Carr.
- B. Omega Engineering
1 Omega Drive
Stamford, CT 06907
Phone: 800-622-2378
www.omega.com
 - 1. Available through Omega Engineering.

2.2 PRODUCT

- A. McMaster-Carr Thermowells
 - 1. Model Number: 3957K64 [CSI 22 05 19.A1]
 - a. Location: roof of Core Module
 - i. Specifically for piping the solar water exchanger [Refer to Section 22 33 30.23 - Residential, Collector-to-Tank, Solar-Electric Domestic Water Heaters]
 - b. Dimensions [Diameter x L]: 1/2" x 4"
 - c. Finish: brass
 - d. Maximum temperature: 400°F
 - e. Maximum pressure: 5,000 psi at 70°F

2. Model Number: 3957K11 [CSI 22 05 19.A2]
 - a. Location: Main House Mechanical Closet
 - i. Specifically for domestic water piping [Refer to Section 22 11 16 - Domestic Water Piping]
 - b. Dimensions [Diameter x L]: 3/4" x 4"
 - c. Finish: brass
 - d. Maximum temperature: 400°F
 - e. Maximum pressure: 5,000 psi at 70°F
- B. Omega Low Flow Liquid Flowmeter [CSI 22 05 19.B1]
 1. Model Number: FTB4707
 2. Location: Main House Mechanical Closet
 3. Dimensions [L x W x H]: 10-1/4" x 2-3/4" x 1-1/2" [259 mm x 69 mm x 40 mm]
 4. Finish: nickel-plated brass
 5. Maximum temperature: 185°F [85°C]
 6. Maximum pressure: 175 psi [12 bar]
 7. Voltage: 5 to 30 Vdc
 8. Current: 20 mA

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with the manufacturer's recommendations.

END OF SECTION 22 05 19

SECTION 22 05 23: GENERAL-DUTY VALVES FOR PLUMBING PIPING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all meters and gages used for the plumbing of The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. DynaQuip Controls
 - 10 Harris Industrial Park
 - St. Clair, MO 63077
 - Phone: 800-545-3636
 - www.dynaquip.com
 - 1. Available through DynaQuip Controls.
- B. Watts
 - 815 Chestnut Street
 - North Andover, MA 01845
 - Phone: 713-943-0688
 - www.watts.com
 - 1. Available through Murray Supply Company.
 - 1084 6th Street Court SE
 - Hickory, NC 28609
 - Phone: 828-431-4636
 - www.murraysupply.com
- C. Cash Acme
 - 2400 7th Avenue S.W.
 - Cullman, AL 35055
 - Phone: 877-700-4242
 - www.cashacme.com
 - 1. Available through Alternative Heating & Supplies.

160 Christian Street
Oxford, CT 06478
Phone: 888-881-1602
www.atheatsupply.com

- D. American Valve, Inc.
PO Box 35229
Greensboro, NC 27425
Phone: 800-645-0101
www.americanvalve.com
1. Available through national chain hardware stores, such as Lowes.
- E. Vanguard Industries, Inc.
831 North Vanguard Street
McPherson, KS 67460
Phone: 620-241-6369
www.vanguardpipe.com
1. Available through national chain hardware stores, such as Lowes.
- F. American Water Heaters
PO Box 1597
Johnson City, TN 37605
Phone: 800-999-9515
www.americanwaterheater.com
1. Available through national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. DynaQuip Controls 3-Way Valve [CSI 22 05 23.A1]
1. Model Number: EYHG4AUE20H
 2. Location: Main House Mechanical Closet
 3. Dimensions [L x W x H]: 3-1/2" x 4-3/4" x 6-3/4"
 4. Finish: brass
 5. Valve size: 3/4"
 6. Rated pressure: 400 psi CWP
 7. Voltage: 24 Vac, 12/24 Vdc
- B. Watts 3/4" Sweat Mixing Valve [CSI 22 05 23.B1]
1. Model Number: 1170-US-M2
 2. Location: Main House Mechanical Closet

3. Weight: 1.6 lbs [.73 kg]
 4. Finish: bronze
 5. Temperature out: 90°F - 160°F [32°C - 71°C]
 6. Maximum temperature: 200°F [93°C]
 7. Maximum pressure: 150 psi [10.34 kPa]
 8. Minimum supply pressure: 30 psi [207 kPa]
- C. Cash Acme Heatguard 3/4" Sweat Mixing Valve [CSI 22 05 23.B2]
1. Model Number: 110-DLF
 2. Location: Main House Mechanical Closet
 3. Finish: bronze
 4. Flow rate: 1.0 gpm - 20 gpm
 5. Temperature out: 90°F - 130°F [32°C - 54°C]
 6. Maximum pressure: 145 psi [1000 kPa]
- D. American Valve 1" Ball Valve [CSI 22 05 23.C1]
1. Model Number: M100S 1
 2. Finish: brass
 3. Turn: quarter turn
 4. Inlet thread type: sweat
- E. American Valve 3/4" Ball Valve [CSI 22 05 23.C1]
1. Model Number: T200W 3/4
 2. Finish: brass
 3. Turn: quarter turn
 4. Inlet thread type: female
- F. American Valve 3/4" Full Port Ball Valve [CSI 22 05 23.C1]
1. Model Number: M100S 3/4
 2. Finish: brass
 3. Turn: quarter turn
 4. Inlet thread type: sweat
- G. American Valve 1" Full Port Ball Valve [CSI 22 05 23.C1]
1. Model Number: M100 1
 2. Finish: brass
 3. Turn: quarter turn
 4. Inlet thread type: female
- H. Vanguard 3/4" x 3/4" Ball Valve [CSI 22 05 23.C1]

1. Model Number: PXV3434
 2. Finish: brass
 3. Turn: quarter turn
 4. Inlet thread type: crimp
 5. Outlet thread type: crimp
 6. Minimum working temperature: 35°F
 7. Maximum working temperature: 200°F
- I. American Valve 1-1/2" Check Valve IPS [CSI 22 05 23.D1]
1. Model Number: M31 1-1/2
 2. Finish: brass
 3. Inlet thread type: female
- J. American Valve 1" Check Valve [CSI 22 05 23.D1]
1. Model Number: M31 1
 2. Finish: brass
 3. Inlet thread type: female
- K. American Water Heater Temperature and Pressure Valve [CSI 22 05 23.E1]
1. Model Number: 6900829
 2. 3" cavity

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with the manufacturer's recommendations.

END OF SECTION 22 05 23

SECTION 22 05 76: FACILITY DRAINAGE PIPING CLEANOUTS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the facility drainage piping cleanouts for domestic water throughout The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Charlotte Piping and Foundry Co.

PO Box 277592

Atlanta, GA 30384

Phone: 800-438-6091

www.charlottepipe.com

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. Charlotte Pipe 3" PVC DWV Cleanout Plug

- 1. Model Number: PVC 00106 1000
- 2. Dimension [Diameter]: 3" [76 mm]
- 3. Inlet thread type: male
- 4. Minimum working temperature: 32°F
- 5. Maximum working temperature: 140°F

- B. Charlotte Pipe 3" DWV Female Adapter

- 1. Model Number: PVC 00101 1200
- 2. Dimension [Diameter]: 3" [76 mm]
- 3. Inlet thread type: female
- 4. Outlet thread type: hub
- 5. Minimum working temperature: 32°F
- 6. Maximum working temperature: 140°F

- C. Charlotte Pipe 3" PVC DWV Wye

- 1. Model Number: PVC 00602 1000
- 2. Dimension [Diameter]: 3" [76 mm]
- 3. Inlet thread type: spigot
- 4. Outlet thread type: hub

5. Minimum working temperature: 32°F
6. Maximum working temperature: 140°F

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 05 76

SECTION 22 11 13: FACILITY WATER DISTRIBUTION PIPING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes facility distribution piping for domestic water throughout The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Viega
 - 301 North Main, 9th Floor
 - Wichita, KS 67202
 - Phone: 800-976-9819
 - www.viega.com
- 1. Available through Murray Supply Company.
 - 1084 6th Street Court SE
 - Hickory, NC 28609
 - Phone: 828-431-4636
 - www.murraysupply.com

2.2 PRODUCTS

- A. Viega PureFlow Manifold 14 Port [CSI 22 11 13.A1]
 - 1. Model Number: MANABLOC
 - 2. Location: Main House Mechanical Closet
 - 3. Dimension [L x W x H]: 15-15/16" x 8" x 3"
 - 4. Port size: 1/2"
 - 5. Flow rate: 4 gpm
 - 6. Pressure drop: 3.4 drop

2.3 ACCESSORIES

- A. Crosslinked Polyethylene [PEX] Tubing [Refer to Section 22 11 16 - Domestic Water Piping]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 11 13

SECTION 22 11 16: DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes distribution piping for domestic water, which includes the fire-suppression loop.

1.2 RELATED SECTIONS

- A. Section 21 10 00 - Water-Based Fire-Suppression Systems
- B. Section 21 16 00 - Fire-Suppression Pressure Maintenance Pumps
- C. Section 22 05 19 - Meters and Gages for Plumbing Piping
- D. Section 22 05 23 - General-Duty Valves for Plumbing Piping
- E. Section 22 11 13 - Facility Water Distribution Piping
- F. Section 22 11 23 - Domestic Water Pump
- G. Section 22 12 19 - Facility Ground-Mounted, Potable-Water Storage Tanks
- H. Section 22 13 19.36 - Air-Admittance Valves
- I. Section 22 13 53 - Facility Septic Tank
- J. Section 22 14 26.13 - Roof Drain
- K. Section 22 33 13 - Instantaneous Electric Domestic Water Heaters
- L. Section 22 33 30.23 - Residential, Collector-to-Tank, Solar-Electric, Domestic Water Heaters

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. REHAU Incorporated
1501 Edwards Ferry Road, NE
Leesburg, VA 20176
Phone: 703-777-5255
www.na.rehau.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Crosslinked Polyethylene [PEX] Tubing [CSI 22 11 16.A1]
 - 1. Comply with NSF/ANSI 14/61 Listed for use in potable water systems.
 - 2. Explicitly approved in the Uniform Plumbing Code, International Plumbing Code, and International Residential Code. Listed by ICC, IAPMO, and CSA
 - 3. PEX shall be used for all domestic water lines to fixtures and appliances in the main house, Flex OM, and Kitchen OM.
- B. PVC Piping [CSI 22 11 16.B1]

1. 1.5" PVC pipe
 - a. From the domestic water pump [Refer to Section 22 11 23 - Domestic Water Pump] to the supply lines for the main house and the water heaters [Refer to Section 22 33 13 - Instantaneous Electric Domestic Water Heaters] in the Flex OM and Outdoor Kitchen.
2. 2" PVC pipe
 - a. From the supply water storage tanks [Refer to Section 22 12 19 - Facility Ground-Mounted, Potable-Water Storage Tanks] for freshwater to the domestic water pump [Refer to Section 22 11 23 - Domestic Water Pump] in the main house.
 - b. For the plumbing of both waste water storage tank and bladder [Refer to Section 22 13 53 - Facility Septic Tank].
3. 3" PVC pipe
 - a. For the roof drain [Refer to Section 22 14 26.13 - Roof Drain] located on the Main House and Flex Space.

2.3 ACCESSORIES

A. Brass Fittings

1. Comply with ASTM F 2080, ASTM F 877, NSF 61, CSA B 137.5

B. Copper Piping

1. For the main house, copper will run through the products below in the following order:
 - a. Appalachian State University Latent Storage Exchange Device [ASU-LSED] [Refer to Section 22 33 30.23 - Residential, Collector-to-Tank, Solar-Electric, Domestic Water Heaters]
 - b. Whole House Water Heater [Refer to Section 22 33 13 - Instantaneous Electric Domestic Water Heaters]
 - c. Wilo Standard Circulating Pump [Refer to Section 22 33 30.23 - Residential, Collector-to-Tank, Solar-Electric, Domestic Water Heaters]
 - d. Next Generation Energy Collectors [Refer to Section 22 33 30.23 - Residential, Collector-to-Tank, Solar-Electric, Domestic Water Heaters].
2. For the Flex OM, type L copper will run through the instant water heater [Refer to Section 22 33 13 - Instantaneous Electric Domestic Water Heaters] to the fixtures.

C. Manifold system will be used for the hot water system [Refer to Section 22 11 13 - Facility Water Distribution Piping] in the Main House.

D. PVC Fittings

1. Use PVC fittings as detailed in the Construction Documents.
2. All drain lines are 2" PVC.

E. Viking BlazeMaster CPVC Piping

1. Used for the supply lines to the water-based fire-suppression system [Refer to Section 21 10 00 - Water-Based Fire-Suppression Systems].

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of PEX should follow the following specifications:

| TUBING SIZE | OD | WALL THICKNESS | ID | VOLUME [GAL/100 FT] | WEIGHT [LBS/100 FT] |
|-------------|-------|----------------|-------|---------------------|---------------------|
| 3/8" | 0.500 | 0.070 | 0.350 | 0.50 | 4.50 |
| 1/2" | 0.625 | 0.070 | 0.475 | 0.92 | 5.80 |
| 5/8" | 0.750 | 0.083 | 0.574 | 1.34 | 8.38 |
| 3/4" | 0.875 | 0.097 | 0.677 | 1.83 | 11.00 |
| 1" | 1.125 | 0.125 | 0.863 | 3.03 | 17.06 |

END OF SECTION 22 11 16

SECTION 22 11 23: DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes the pump used to supply all potable water for The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping
- B. Section 22 12 19 - Facility Ground Mounted, Potable Water Storage Tanks
- C. Section 22 33 13 - Instantaneous Electric Domestic Water Heaters

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Grundfos
 - 17100 West 118th Terrace
 - Olathe, KS 66061
 - Phone: 913-227-3400
 - www.grundfos.com
 - 1. Available through Murray Supply Company.
 - 1084 6th Street Court SE
 - Hickory, NC 28609
 - Phone: 828-431-4636
 - www.murraysupply.com

2.2 PRODUCT

- A. Grundfos 1/2 Horsepower Pump
 - 1. Model Number: JPF3A
 - 2. Location: underneath Outdoor Shower
 - 3. Dimensions [L x W x H]: 16-1/4" x 9-1/8" x 8-1/2"
 - 4. Finish: cast iron
 - 5. Flow range: 1.7 - 12.2 gpm
 - 6. Maximum working pressure: 87 psi
 - 7. Maximum fluid temperature range: 14°F - 104°F [-10°C - 40°C]

- 8. Horsepower: 1/2 hp
- 9. Wattage: 850 W
- 10. Voltage: 230 V

2.3 ACCESSORIES

- A. 1-1/2" PVC Piping [Refer to Section 22 11 16]
- B. 2" PVC Piping [Refer to Section 22 11 16]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 11 23

SECTION 22 12 19: FACILITY GROUND-MOUNTED, POTABLE-WATER STORAGE TANKS**PART 1 - GENERAL**

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes the storage tank for potable water.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping
- B. Section 22 11 23 - Domestic Water Pumps

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Rotonics Manufacturing, Inc.
17022 South Figueroa Street
Gardena, CA 90248-3019
Phone: 800-327-5062
www.rotonics.com
 - 1. Available through Rotonics.
- B. WellSaver/Lowes
1000 Lowe's Blvd
 Mooresville, NC 28117
Phone: 704-758-1000
www.lowes.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. Rotonics Loaf Water Tank [CSI 22 12 19.A1]
 - 1. Model Number: 6457 H
 - 2. Location: east of the north ramp beneath straw bales
 - 3. Dimensions [L x W x H]: 62-1/2" x 41-1/2" x 30"
 - 4. Weight: 95 lbs

5. Capacity: 300 gal
6. 8" lid opening
- A. WellSaver 20-Gallon Pump Tank [CSI 22 12 19.B1]
 1. Model Number: LPT-20H
 2. Location: underneath Outdoor Shower
 3. Dimensions [Diameter x H]: 15" x 17"
 4. Capacity: 20 gallons
 5. Drawdown gallons:
 - a. 7.4 gallons @ 20-40 PSI
 - b. 6.2 gallons @ 30-50 PSI
 - c. 5.4 gallons @ 40-60 PSI

2.3 ACCESSORIES

- A. Rotonics Loaf Water Tank
 1. 4" fill cap [CSI 22 12 19.C1]
 2. 1-1/2" PVC bulkhead fitting [CSI 22 12 19.D1]

PART 3 - EXECUTION

3.1 PLACEMENT

- A. Tank will be located on three 4" x 4" sleepers with 3/4" plywood beside the north side ramp.

3.2 INSTALLATION

- A. Plumb with 2" PVC piping unless otherwise specified [Refer to Section 22 11 16 - Domestic Water Piping].
- B. Install in accordance with manufacturer's specifications.

END OF SECTION 22 12 19

SECTION 22 13 19.36: AIR-ADMITTANCE VALVES**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the air-admittance valve used for drainage line of The Solar Homestead's plumbing system.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Oatey
4700 West 160 Street
Cleveland, OH 44135
Phone: 800-321-9532
www.oatey.com
 - 1. Available through Oatey.

2.2 PRODUCT

- A. Sure-Vent Air-Admittance Valve
 - 1. Model Number: 39016
 - 2. Location: Flex Bath
 - 3. Dimensions [Diameter x L]: 2-5/8" x 4-1/2"
 - 4. Weight: 0.37 lbs
 - 5. PVC with 2" NPT threads
 - 6. 2" PVC adapter

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 13 19.36

SECTION 22 13 53: FACILITY SEPTIC TANK**PART 1 - GENERAL**

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes the waste water storage tanks used for The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Husky Portable
PO Box 126
397202 W. 1400 Rd.
Dewey, OK 74029
Phone: 800-260-9950
www.huskyportable.com
 - 1. Available through The Tank-Depot
1627 South Dixie Hwy
Pompano Beach, FL 33060
Phone: 866-926-5603
www.tank-depot.com

2.2 PRODUCT

- A. Husky Custom Waste Water Bladder Tank [CSI 22 13 53.A1]
 - 1. Location: underneath Deck
 - 2. Dimensions [L x W x H]: 240" x 60" x 8"
 - 3. Weight: 60 lbs
 - 4. Capacity: 500 gallons
- B. Husky 25 Gallon Waste Water Bladder Tank [CSI 22 13 53.A2]
 - 1. Model Number: HPC-BT-25
 - 2. Location: underneath the Great Porch

3. Dimensions [L x W x H]: 24" x 36" x 8"
4. Weight: 10 lbs
5. Capacity: 25 gallons

2.3 ACCESSORIES

- A. 1-1/2" flange and ball valve [CSI 22 13 53.B1]
- B. 2" PVC vent [CSI 22 13 53.C1]
- C. 3" PVC bulkhead fitting [CSI 22 13 53.D1]
- D. 4" fill cap [CSI 22 13 53.E1]

PART 3 - EXECUTION

3.2 PLACEMENT

- A. The 500 gallon tank will be located on three 4" x 4" sleepers with 3/4" plywood underneath the Deck.
- B. The 25 gallon tank will be located on two 4" x 4" sleepers with 3/4" plywood underneath the Great Porch.

3.3 USES

- A. Tanks will house waste water drained from residential appliances and fixtures in the house.

3.4 INSTALLATION

- A. Plumb with 2" PVC piping [Refer to Section 22 11 16 - Domestic Water Piping] unless otherwise specified.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 13 53

SECTION 22 14 26.13: ROOF DRAINS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the roof drains for The Solar Homestead to be used on the Main House and Flex OM.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Zurn Engineered Water Solutions
1801 Pittsburgh Ave.
Erie, PA 16502
www.zurn.com

- 1. Available through Murray Supply Company.
1084 6th Street Court SE
Hickory, NC 28609
Phone: 828-431-4636
www.murraysupply.com

2.2 PRODUCTS

- A. Zurn Small Area Roof Drain
 - 1. Model Number: RD2080
 - 2. Dimensions [Diameter x L]: 8-3/8" x 9-7/8" [213 mm x 275 mm]
 - 3. 2" PVC hub connection

2.3 ACCESSORIES

- A. 3" PVC piping [Refer to Section 22 11 16 - Domestic Water Piping]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 14 26.13

SECTION 22 33 13: INSTANTANEOUS ELECTRIC DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the mechanism for multiple instantaneous electric domestic water heaters throughout The Solar Homestead. Refer to electrical and plumbing drawings in the Construction Documents for details.

1.2 RELATED SECTIONS

- A. Section 22 11 16 - Domestic Water Piping

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Stiebel Eltron
17 West Street
West Hatfield, MA 01088
Phone: 800-582-8423
www.stiebel-eltron-usa.com
 - 1. Available from national chain plumbing wholesalers and retailers.
- B. Utilitech
3020 Penn Avenue
West Lawn, PA 19609
Phone: 610-777-3200
www.utilitech.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. Stiebel Eltron Tempra Tankless Electric Whole House Water Heater [CSI 22 33 13.A1]
 - 1. Model Number: 24
 - 2. Location: Main House Mechanical Closet
 - 3. Dimensions [W x H x D]: 16-5/8" x 14-1/2" x 4-5/8"
 - 4. Weight: 15.4 lbs
 - 5. Working pressure: 150 psi
 - 6. Wattage: 24 kW
 - 7. Voltage: 240 V

8. Current: 2 x 50 A
- B. Stiebel Eltron Mini 6 Point-of-Use Electric Tankless Electric Water Heater [CSI 22 33 13.A2]
 1. Model Number: 220817- MINI 6
 2. Location: Flex Bath and Outdoor Kitchen Mechanical Closet
 3. Dimensions [W x H x D]: 7-1/2" x 6-1/2" x 3-1/4"
 4. Weight: 3.44 lbs
 5. Working pressure: 150 psi
 6. Wattage: 537 W
 7. Voltage: 220-240 V
 8. Current: 24.7 A

2.3 ACCESSORIES

- A. Utilitech 2 Gallon Water Heater Expansion Tank [CSI 22 33 13.B1]
 1. Model Number: LET-2
 2. Location: Main House Mechanical Closet
 3. Dimensions [Diameter x H]: 8" x 12-1/2"
 4. Capacity: 2 gallons
- B. Water connections 3/4" and 3/8"
- C. PEX and copper piping [Refer to Section 22 11 16]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The main house hot water heater will be attached to the hot water loop of the main house and is located in the mechanical closet.
- B. The mini tankless hot water heaters will be installed under the kitchen sink in the Outdoor Kitchen and the bathroom sink in the Flex Bath.
- C. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 33 13

SECTION 22 33 30.23: RESIDENTIAL, COLLECTOR-TO-TANK, SOLAR-ELECTRIC DOMESTIC WATER HEATERS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the solar thermal water heating components used in The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Appalachian State University Solar Thermal Collector Bank: This device is a student-designed-and-built low-concentration solar thermal collector. The purpose of the collector is to provide solar thermal energy for indirect domestic water heating. The collector consists of 10 evacuated tubes, each paired with a custom concentrator. The concentrator optical design revolved around ease of manufacturing, simplicity, and low cost production. The resulting concentrator is a round design. Each concentrator is bolted to an aluminum frame to support the collector. Finally a 1/2" brazed copper header is fitted onto the collector and plumbed into the solar thermal water heating loop.
- B. Appalachian State University Latent Storage and Exchange Device: This device is a student-designed-and-built heat exchanger with integral phase change material energy storage, specifically for use with solar thermal water heating systems. The purpose is to absorb energy from a solar thermal working fluid using a phase change material while simultaneously allowing energy exchange to the domestic water supply for domestic hot water uses such as cleaning, bathing, etc. The phase change material is immobile within the LSED, while the solar thermal working fluid and domestic water supplies flow through separate tubing. Therefore, there is no local hot water storage as in traditional electric water heaters.

1.3 RELATED SECTIONS

- A. Section 22 05 19 - Meters and Gages for Plumbing Piping
- B. Section 22 05 23 - General-Duty Valves for Plumbing Piping
- C. Section 22 11 16 - Domestic Water Piping

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Next Generation Energy
75 Waneka Parkway
Lafayette, CO 80026
Phone: 303-665-2000
www.ngeus.com
 - 1. Available through Indoor Environmental Systems, Inc.
924 West Chatham Street
Cary, NC 27511
Phone: 919-336-5287
www.indoorenviro.com

- B. Wicks & Wax
2565 Eastbrook Parkway
Burnaby, BC V5C5W2
Canada
Phone: 604-294-1232
www.wicksandwax.com
1. Available through Wicks & Wax.
- C. Sunda Solar
No.10 Da Yang Fang, Beiyuan Road
Chaoyang District, Beijing 100012
China
Phone: 86-106-200-1008
www.sundasolar.com
1. Available through Alternative Energy Engineering.
1271 Evergreen Road, #1
Redway, CA 95560
Phone: 800-777-6609
www.aeesolar.com
- D. Dragon Breath
Sardis Cross
Milford Haven, Pembrokeshire
SA73 1LX
United Kingdom
Phone: 0-164-660-0151
www.solardragons.co.uk
1. Available through Alternative Heating & Supplies.
160 Christian Street
Oxford, CT 06478
Phone: 888-881-1602
www.atheatsupply.com
- E. Wilo
Nortkirchenstraße 100
D-44263 Dortmund
Germany

Phone: 4-902-314-1020

www.wilo.com

1. Available through Wilo.

F. Utilitech

3020 Penn Avenue

West Lawn, PA 19609

Phone: 610-777-3200

www.utilitech.com

1. Available at national chain hardware stores, such as Lowes.

G. Steelworks

1. Available at national chain hardware stores, such as Lowes.

H. The Hillman Group

10590 Hamilton Avenue

Cincinnati, OH 45231

Phone: 800-800-4900

www.hillmangroup.com

1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

A. Appalachian State University Solar Thermal Collector Bank [CSI 22 33 30.23.A1]

1. Location: roof over Core Module
2. Dimensions [L x W x H]: 62" x 72-13/16" [without header] x 7"
3. Number of tube collectors: 10
4. C Trough [CSI 22 33 30.23.A11]
 - a. Designed and manufactured by Appalachian State University students and faculty with products below:

| Product | Manufacturer | Model Number | Amount Per Trough |
|-------------------|------------------------------|---------------------|-------------------------|
| Resin | West Marine | 105 | 32 squirts |
| Hardener | West Marine | 205/207 [50/50 Mix] | 32 squirts [16 of each] |
| Fiberglass | Fiberglass Supply | | 1 set |
| Mirror Film | ReflectTech | | 4 sq ft |
| Rubber Grommets | Rubber Products Distributors | G3404 | 2 grommets |
| 1/4" Washers | McMaster | 91090A107 | 12 |
| 1/4" Lock Washers | McMaster | 91102A029 | 1 |
| 1/4" Nuts | McMaster | 90473A029 | 4 |
| 1/4" Bolts | McMaster | 91309a542 | 4 |
| 4' Wood Dowels | McMaster | 9683K53 | 3 sticks |
| Swagelok Fittings | Swagelok | B-600-6-5 | 2 fittings |

5. Next Generation Energy Collector [CSI 22 33 30.23.A12]

- a. Model Number: NGE-224-TU
- b. Location: roof over Core Module
- c. Dimensions [L x W x H]: 77-1/2" x 73" x 6-1/4"
- d. Weight: 185 lbs
- e. Outer tube diameter: 2-1/4"
- f. Inner tube diameter: 1-7/8"
- g. Collector casing: aluminum
- h. *Only the evacuated tube will be used as part of the Solar Thermal Collector Bank.*

6. Solar Thermal Header [CSI 22 33 30.23.A13]

Designed and manufactured by Appalachian State University students and faculty with products below:

| Product | Manufacturer | Amount |
|-------------------------|--------------|---------|
| 1/2" Nom. Copper Type L | Lowes | 40 ft |
| 1/4" Nom. Copper Type L | Lowes | 7 ft |
| 1/2" Reducing Tee | McMaster | 42 tees |
| 1/2" End Cap | Lowes | 2 caps |

7. Solar Thermal Collector Frame [CSI 22 33 30.23.A14]

- a. Designed and manufactured by Appalachian State University students and faculty
- b. 1-1/2" aluminum angle 1/8" Thick Stock from Lowes with a length of 65'

B. Sunda Seido2 [CSI 22 33 30.23.F1]

- 1. Model Number: Seido 2-16
- 2. Location: roof over Core Module
- 3. Dimensions (L x W x H): 83-3/4" x 75-1/2" x 5-3/8" [2126 mm x 1920 mm x 150 mm]
- 4. Weight: 220.5 lbs [100 kg]

5. Tube construction: SEIDO2---Direct flow vacuum tube with flat absorber
 6. Angle of inclination: 0° to 90°
 7. Number of tube collectors: 16
 8. Absorber area: 2.77 m²
 9. Aperture area: 2.93 m²
 10. Gross area: 4.08 m²
- C. Appalachian State University Latent Storage and Exchange Device [ASU-LSED] [CSI 22 33 30.23.B1]
1. Designed and manufactured by Appalachian State University students and faculty.
 2. Location: Main House Mechanical Closet
 3. Dimensions [L x W x H]: 40" x 28" x 20"
 4. Wicks & Wax Re-Melt Paraffin Wax Blend [CSI 22 33 30.23.B11]
 - a. Collected and re-melted and combined paraffin wax with a melting point of 140°F.
 - b. This will be used as a medium for thermal storage in a custom built heat-exchanging device "ASU-LSED."
 5. Custom Drain Pan [CSI 22 33 30.23.B12]
 - a. Designed by Appalachian State University students and faculty. Manufactured by Triplett & Coffey.
 - b. Dimensions [L x W x H]: 55" x 35" x 2"
 - c. Material: 1/8" Aluminum

2.3 ACCESSORIES

- A. McMaster-Carr Thermowells [Refer to Section 22 05 19 - Meters and Gages for Plumbing Piping]
- B. DynaQuip Controls 3-Way Valve [Refer to Section 22 05 23 - General-Duty Valves for Plumbing Piping]
- C. Dragon Breath Heater [CSI 22 33 30.23.C1]
1. Model Number: DB70
 2. Location: HVAC Compartment
 3. Location [L x W x D]: 7-1/2" x 17-1/2" x 22"
 4. Flow rate: 12 gpm
 5. Efficiency: 69,892 BTU/hr
 6. Current: 1.4 A
- D. Heat Dump Mounting System [CSI 22 33 30.23.C11]
1. Steelworks Plated Perforated Tube
 - a. Model Number: 11203
 - b. Location: HVAC Compartment
 - c. Dimensions [L x W x H]: 3' x 1-1/2" x 1-1/2"
 - d. 14 gauge

- e. Finish: galvanized zinc
- 2. The Hillman Group Threaded Rod
 - a. Model Number: 880990
 - b. Location: HVAC Component
 - c. Dimensions [Diameter x L]: 1/4" x 6'
 - d. Threads per inch: 18"
- E. Omega Low Flow Liquid Flowmeter [Refer to Section 22 05 19 - Meters and Gages for Plumbing Piping]
- F. Wilo Standard Circulating Pump [CSI 22 33 30.23.D1]
 - 1. Model Number: Star 32 F
 - 2. Location: Main House Mechanical Closet
 - 3. Dimensions [L x W x H]: 5-1/16" x 5-3/8" x 6-3/8"
 - 4. Finish: cast iron
 - 5. Maximum working pressure: 140 psi
 - 6. Wattage: 113 W
 - 7. Voltage: 115 V
- G. Utilitech 5 Gallon Water Heater Expansion Tank [CSI 22 33 30.23.E1]
 - 1. Model Number: LET-5
 - 2. Location: Main House Mechanical Closet
 - 3. Dimensions [Diameter x H]: 11" x 14-3/4"
 - 4. Capacity: 5 gallons
- H. Copper tubing: 1/2" nominal, type L [Refer to Section 22 11 16 - Domestic Water Piping]
- I. Copper tubing: 3/4" nominal, type L [Refer to Section 22 11 16 - Domestic Water Piping]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Proper insulation of components and plumbing is necessary.
- C. ASU Solar Thermal Collector Bank
 - 1. Installation instructions are proprietary of Appalachian State University's The Solar Homestead.
- D. ASU Latent Storage and Exchange Device
 - 1. Installation instructions are proprietary of Appalachian State University's The Solar Homestead.
- E. Re-melt paraffin wax blend
 - 1. Used in a self-contained custom heat exchanger unit that will be filled and sealed prior to the competition in the mechanical closet.

2. Wax will act as a phase change material that will assist in the heat exchange between the solar thermal system and the domestic hot water plumbing.

END OF SECTION 22 33 30.23

SECTION 22 41 13: RESIDENTIAL WATER CLOSETS, URINALS, AND BIDETS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the residential water closets in the Flex Bath and Core Module Bath.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Toto USA, Inc.
 - 1155 Southern Road
 - Morrow, GA 30260
 - Phone: 770-282-8686
 - www.totousa.com
- 1. Available through Cregger Company: Gateway Center.
 - 1542 Hwy 421
 - Boone, NC 28607
 - Phone: 828-265-0505

2.2 PRODUCTS

- A. Aquia II Close Couple Toilet
 - 1. Model Number: CST412MF.10
 - 2. Location: Core Module Bath, Flex Bath
 - 3. Finish: 01 cotton
 - 4. 10" rough-in
 - 5. Dual flush water consumption 1.6-0.9 gpf
 - 6. Meets EPA WaterSense® criteria

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Clear 100% silicon caulk shall be used in all joints.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 41 13

SECTION 22 41 16: RESIDENTIAL LAVATORIES AND SINKS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the sinks for the Living Module, Outdoor Kitchen, Core Module Bath, and Flex Bath.

1.2 RELATED SECTIONS

- A. Section 12 35 30.23 - Bathroom Casework

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Moen

25300 Al Moen Drive

North Olmsted, OH 44070

Phone: 800-283-6636

www.moen.com

- 1. Available at national chain hardware stores, such as Lowes.

B. Avanity Corporation

3778 Rockwell Avenue

El Monte, CA 91731

Phone: 626-404-7678

www.avanitystore.com

- 1. Available at national chain department stores, such as Sears.

C. Opella

1160 West 13 Street

Riviera Beach, FL 633404

Phone: 772-919-7905

www.opella.com

- 1. Available through Holliday Sales.

1711 University Commercial Pl

Charlotte, NC 28213-6444

Phone: 704-597-9759

www.holiday-sales.com

D. IKEA

8300 IKEA Blvd
Charlotte, NC 28262
Phone: 704-549-4532
www.ikea.com

1. Available through IKEA.

2.2 PRODUCTS

A. Moen Camelot 20 Gauge Double Bowl Drop In Sink

1. Model Number: 22234
2. Location: Living Module
3. Dimensions [W x H]: 25.5" x 18.75"
 - a. Bowl 1 dimensions [W x H x D]: 14" x 16" x 7"
 - b. Bowl 2 dimensions [W x H x D]: 7-1/2" x 16" x 5"
4. Finish: stainless steel

B. Avanity Vitreous China Vessel Sink - Square

1. Model Number: CVE460SQ
2. Location: Core Module Bath
3. Dimensions [W x H x D]: 18" x 18" x 6"
4. Finish: white

C. Opella Undermount Bar Sink

1. Model Number: 13200.045
2. Location: Outdoor Kitchen
3. Dimensions [W x H x D]: 9" x 12" x 5-1/8"
4. Finish: stainless Steel

D. IKEA Lillangen Ceramic Sink

1. Model Number: 001.483.32
2. Location: Flex Bath
3. Dimensions [L x W x H]: 33-1/8" x 17-3/8" x 6-7/8"
4. Weight: 53 lbs
5. Finish: porcelain
6. Included in IKEA vanity [Refer to Section 12 35 30.23 - Bathroom Casework]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Level shall be maintained while installing sinks.

- B. Clear 100% silicon caulk shall be used at all joints.
- C. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 41 16

SECTION 22 41 23: RESIDENTIAL SHOWERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the shower for Core Module Bath and the Outdoor Shower.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Delta Faucet Company
55 East 111 Street
Indianapolis, IN 46280
Phone: 317-848-1812
www.deltafaucet.com
 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Delta Arzo Showerhead
 1. Model Number: 57740-SS
 2. Location: Core Module Bath and Outdoor Shower
 3. 8" spray face
 4. Finish: stainless steel
 5. Minimum flow rate: 2.5 gpm
 6. Minimum flow pressure: 80 psi

2.3 ACCESSORIES

- A. Delta MultiChoice Shower Valve
 1. Model Number: R10000-UNWS
 2. Location: Core Module Bath and Outdoor Shower
- B. Delta Shower Trim Kit
 1. Model Number: T14053-SS
 2. Location: Core Module Bath and Outdoor Shower
 3. Finish: stainless steel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Clear 100% silicon caulk shall be used at all joints.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 41 23

SECTION 22 41 39: RESIDENTIAL FAUCETS, SUPPLIES, AND TRIM**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the faucets, supplies, and trims for the Living Module, Core Module Bath, Flex Bath, and Outdoor Kitchen.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Delta Faucet Company
55 East 11 Street
Indianapolis, IN 46280
Phone: 713-983-3000
www.deltafaucet.com
 - 1. Available through national chain hardware stores, such as Lowes.
- B. Pfister Faucets
19701 DaVinci
Lake Forest, CA 92610
Phone: 800-713-7080
www.pfisterfaucets.com
 - A. Available through national chain hardware stores, such as Lowes.
- C. AquaSource
11302 Tanner Road
Houston, TX 77041
Phone: 713-983-3000
 - 1. Available through national chain hardware stores, such as Lowes.
- D. Arrowhead Brass & Plumbing, LLC
4900 Alhambra Avenue
Los Angeles, CA 90032
Phone: 323-211-9137
www.arrowheadbrass.com
 - 1. Available through The Faucet Depot
7142 East Sauson Avenue

Commerce, CA 90040
Phone: 888-328-2389
www.faucetdepot.com

2.2 PRODUCTS

- A. Delta Kitchen Faucet
 - 1. Model Number: 185LF-SS
 - 2. Location: Core Module Bath
 - 3. Spout height: 7"
 - 4. Finish: brilliance stainless
- B. Delta Bar Faucet
 - 1. Model Number: 1903-SS-DST
 - 2. Location: Outdoor Kitchen
 - 3. Finish: stainless steel
- C. Price Pfister Skye Bathroom Faucet
 - 1. Model Number: F-042-SYKK
 - 2. Location: Flex Bath
 - 3. Finish: brushed nickel
- D. AquaSource 1-Handle Pull-Down Kitchen Faucet
 - 1. Model Number: 406208233
 - 2. Location: Living Module
 - 3. Spout height: 20"
 - 4. Finish: stainless steel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Clear 100% silicon caulk shall be used at all joints.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 22 41 39

SECTION 23 09 13.23: SENSORS AND TRANSMITTERS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes sensors and transmitters used in The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Vaisala, Inc

2880 Slater Road

Suite 200

Morrisville, NC 27560

Phone: 919-361-2479

www.vaisala.com

1. Available through Vaisala, Inc.

- B. Building Automation Products, Inc [BAPI]

750 North Royal Avenue

Gays Mills, WI 54631

Phone: 608-735-4800

www.bapihvac.com

1. Available through Building Automation Products, Inc [BAPI].

- C. Digital Control Systems

7401 SW Capitol Highway

Portland, OR 97219

Phone: 877-468-6337

www.dcs-inc.net

1. Available through Digital Control Systems.

2.2 PRODUCTS

- A. Vaisala Temperature and Relative Humidity Probe [CSI 23 09 13.23.A1]

- a. Model Number: HMP60

- b. Location: HVAC Compartment, South Hall

- c. Dimensions [Diameter x L]: 1/2" x 2-3/4" [12 mm x 71 mm]

- d. Temperature measurement range: -40° C to +60°C with accuracy of $\pm 0.6^{\circ}\text{C}$

- B. BAPI Low Profile “Button” Sensor [CSI 23 09 13.23.B1]
 - a. Model Number: BA/10K-2-LP-15
 - b. Location: Bedroom Module
 - c. Dimensions [Diameter x D]: 3/8” x 1” [9.5 mm x 25.4 mm]
 - d. Thermistors: 10K Ω @ 25°C
 - e. Low profile flush mounting sheath
- C. DCS AirSense Infrared Carbon Dioxide Sensor [CSI 23 09 13.23.C1]
 - a. Model Number: 310e
 - b. Location: Main House Mechanical Closet
 - c. Dimensions [L x W x H]: 5-1/4” x 3-1/4” x 1-3/8”
 - d. Measurement range: 0-2000 ppm

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer’s recommendations.

END OF SECTION 23 09 13.23

SECTION 23 34 00: HVAC FAN**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the ventilation fan used in the Core Module Bath of The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Broan-NuTone, LLC
PO Box 140
Harford, WI 53027
Phone: 800-558-1711
www.broan.com

- 1. Available through Broan-NuTone, LLC.

2.2 PRODUCTS

- A. Broan Ultra Silent Humidity Sensing Fan
 - 1. Model Number: QTXE110S
 - 2. Location: Core Module Bath
 - 3. Dimensions [L x W x H]: 10-1/2" x 11-3/8" x 7-5/8"
 - 4. Weight: 12.2 lbs
 - 5. Current: 0.3 A
 - 6. 0.7 sones
 - 7. 110 CFM

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 23 34 00

SECTION 23 37 00: AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the air outlets and inlets used within the main house of The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Panasonic Corporation
2 Panasonic Way
Secaucus, NJ 07094
Phone: 866-292-7292
www.panasonic.com

- 1. Available through Amazon.
1200 12th Avenue S
Suite 1200
Seattle, WA 98144
Phone: 866-216-1072
www.amazon.com

2.2 PRODUCTS

- A. Panasonic Passive Inlet Vent
 - 1. Model Number: FV-GKF32S1
 - 2. Location: Bedroom Module
 - 3. Dimensions [Diameter x L]: 3" x 12" [76.2 mm x 304.8 mm]
 - 4. 2 position air delivery
 - 5. Insulation lining
 - 6. 3 setting positions: closed, 12 cfm, 18 cfm

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 23 37 00

SECTION 23 71 00: THERMAL STORAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the Trombe Wall in the Living Module.

1.2 SYSTEM DESCRIPTION

- A. ASU Trombe Wall: This system is a tasteful reinterpretation of the classic Trombe wall – a passive solar heating device – that uses vertical aluminum, black powder coated “Trombe fins” filled with an oil-based phase change material to regulate energy transfer to conditioned space. The purpose of the Trombe Wall is to provide passive solar heating during cooler times [such as nighttime] by releasing energy stored during the day in the phase change material over the day. The Trombe fins can be freely rotated into position to achieve natural daylighting as well as light reduction as desired. The Trombe Wall is located behind a double pane glazing.

1.3 RELATED SECTIONS

- A. Section 08 43 13 - Aluminum-Framed Storefront

1.4 SUBMITTALS

- A. Product Data
- B. Material Safety Data Sheet [MSDS]

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Phase Change Energy Solutions
120 East Pritchard Street
Asheville, NC 27203
Phone: 336-629-3000
www.phasechangepcm.com

- 1. Available through Phase Change Energy Solutions/Vesture.

2.2 PRODUCTS

- A. Appalachian State University Trombe Wall [CSI 23 71 00.A1]
 - 1. Location: Living Module
 - 2. Trombe Wall Fins [CSI 23 71 00.A11]
 - a. Design by Appalachian State University students and faculty and manufactured by Triplett & Coffey.
 - b. 2" x 5" architectural aluminum tubing
 - c. Dimensions [H]: 6'
 - d. Mill finish
 - e. Finish: powder coated black
 - 3. Phase Change Material [CSI 23 71 00.A12]

- a. Model Number: BIOPCM- 27M
- b. Oil based phase change material with a peak melting point at approximately 79° F [27°C].
- c. Stored in Trombe Wall Fins to be used as a passive cooling and heating device.
- d. Latent heat storage capacity: 165-200

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Phase change material is integrated with the Trombe Wall fins.
- B. Installation instructions are proprietary of Appalachian State University's The Solar Homestead.

END OF SECTION 23 71 00

SECTION 23 81 43: AIR-SOURCE UNITARY HEAT PUMP**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes specifications for the HVAC systems for both the Flex Space and the Main House.

1.2 RELATED SECTIONS

- A. Section 07 21 19 - Foamed-In-Place Insulation

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Mitsubishi Electric

4600 Park Road

Suite 300

Charlotte, NC 28209

Phone: 704-525-1888

www.mitsubishielectric.com

- 1. Available through Gemaire Distributors Inc.

1279 26th St. SE

Hickory, NC 28602

Phone: 828-322-2365

www.gemaire.com

- B. LG Electric

201 James Record Rd

PO Box 240007

Huntsville, AL 35813

Phone: 800-793-8896

www.lg.com

- 1. Available through LG Electric.

- C. BBJ Engineering

Apex Way Hailsham

East Sussex BN27 3WA

United Kingdom

Phone: +44-0-132-384-8842

www.aspenpumps.com

1. Available through e-ComfortUSA.
1374 Abbott Court
Buffalo Grove, IL 60089
Phone: 866-554-4328
www.e-ComfortUSA.com

2.2 PRODUCT

A. Mitsubishi Mr. Slim Mini Split Heat Pump

1. Model Number: MXZ-2B20NA [CSI 23 81 43.A1]
 - a. Outdoor Model Number: MXZ-2B20NA
 - i. Location: HVAC Compartment
 - ii. Dimensions [W x H x D]: 33-1/16" x 27-15/16" x 13" [840 mm x 710 mm x 330 mm]
 - iii. Weight: 130 lbs [59 kg]
 - iv. SEER [efficiency]: 18
 - v. Rated cooling capacity: 18,000 BTU/hr - 20,000 BTU/hr
 - vi. Rated heating at 47°F capacity: 22,000 BTU/hr
 - vii. Rated heating at 17°F capacity: 12,500 BTU/hr
 - b. Indoor Model Number: SEZ-KD09NA4 [CSI 23 81 43.A2]
 - i. Location: Laundry Closet, Mechanical Closet
 - ii. Dimensions [W x H x D]: 31-1/8" x 7-7/8" x 27-9/16" [790 mm x 200 mm x 700 mm]
 - iii. Weight: 40 lbs [18 kg]
 - iv. SEER [efficiency]: 15
 - v. Rated cooling capacity: 9,000 BTU/hr
 - vi. Rated heating capacity: 10,900 BTU/hr

B. LG Split Air Conditioner

1. Model Number LA095HV
 - a. Indoor Model Number: LAN095HV [CSI 23 81 43.B1]
 - i. Location: Flex Space
 - ii. Dimensions [W x H x D]: 35-3/16" x 11-1/8" x 6-1/2" [770 mm x 283 mm x 165 mm]
 - iii. Weight: 23.1 lbs [10.5 kg]
 - iv. Rated voltage indoor 230/208-60-1
 - v. Indoor dB: 38/35/32 A
 - b. Outdoor Model Number: LAU095HV [CSI 23 81 43.B2]
 - i. Location: Outdoor Kitchen Mechanical Closet

- ii. Dimensions [W x H x D]: 30-5/16" x 21-5/16" x 9-5/8" [786 mm x 557 mm x 244 mm]
 - iii. Weight: 83.8 lbs [38 kg]
 - iv. Rated voltage outdoor 230/208-60-1
 - v. Outdoor dB: 48 A
2. Finish: PSAPECW10 organic cream white
 3. High-wall duct-free
 4. Cooling capacity: 9,200/8,900 BTUs
 5. Heating capacity: 12,000/11,700 BTUs

2.3 ACCESSORIES

- A. BBJ Engineering Mr. Slim Mounting Bracket [CSI 23 81 43.A3]
 1. Model Number: CKB4
 2. Location: HVAC Compartment
 3. Dimensions [W x H x D]: 43.3" x 23.8" x 17.7"[1100 mm x 580 mm x 450 mm]
 4. Maximum load: 300 lbs [140 kg]
 5. Finish: ivory

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Ductwork
 1. 6" Flex duct feed to one vent to each bedroom, bathroom, and two vents to living room.
 2. Duct insulation provided via spray foam insulation from roofing. [Refer to Section 07 21 19 - Foamed-In-Place Insulation]
- B. Lines
 1. Avoid sharp turns and excessive movement of refrigerant lines. Keep as straight as possible with the shortest and most appropriate route. Ensure all lines are parallel and perpendicular to wall and floor lines and to appear straight and in good order.
 2. Slope suction lines down slightly [1" in 20'] towards the outdoor unit [Refer to manufacturer's installation guide for refrigerate line length for considerations.] Provide oil traps at the base of vertical suction risers over 6 feet high.
- C. Install in accordance with manufacturer's recommendations.

END OF SECTION 23 81 43

SECTION 25 13 00: INTEGRATED AUTOMATION CONTROL AND MONITORING NETWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the integrated automation equipment, including the programmable logic controller for The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. The home automation system utilizes a programmable logic controller [PLC] with an array of temperature and humidity sensors to control comfort levels, fresh air intake, and solar thermal system performance.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Automation Direct
3505 Hutchinson Road
Cumming, GA 30040
Phone: 800-633-0405
www.automationdirect.com
 - 1. Available through Automation Direct.
- B. Sola/Heavy Duty
3680 North 126th Street
Brookfield, WI 53005
Phone: 262-252-1600
www.solahevidutysales.com
 - 1. Available through Sola/Heavy Duty.

2.2 PRODUCTS

- A. Automation Direct Programmable Logic Controller [PLC] [CSI 25 13 00.A1]
 - 1. 5 Slot Base
 - a. Model Number: P3-05B
 - b. Location: Main House Mechanical Closet
 - c. Dimensions [L x W x H]: 11-1/4" x 4-3/4" x 6" [286 mm x 121 mm x 152 mm]
 - d. Weight: 26.5 oz [752 g]
 - e. Operating temperature: 32°F - 140°F [0°C - 60°C]
 - f. Storage temperature: -4°F - 158°F [-20°C - 70°C]

2. CPU Module
 - a. Model Number: P3-550
 - b. Location: Main House Mechanical Closet
 - c. Dimensions [L x W x H]: 11-1/4" x 4-3/4" x 6" [286 mm x 121 mm x 152 mm]
 - d. Weight: 9 oz [260 g]
 - e. User memory: 50 MB
 - f. Memory type: flash and battery backed RAM
 - g. Operating temperature: 32°F - 140°F [0°C - 60°C]
 - h. Storage temperature: -4°F - 158°F [-20°C - 70°C]
3. AC Power Supply
 - a. Model Number: P3-01AC
 - b. Location: Main House Mechanical Closet
 - c. Weight: 12.1 oz [365 g]
 - d. Input voltage range: 100-240 VAC [-15% /+10%]
 - e. Rated operating frequency: 50 - 60 Hz with \pm 5% tolerance
 - f. Maximum input power: 72W
4. DC Input Modules
 - a. Model Number: P3-08ND3S
 - b. Location: Main House Mechanical Closet
 - c. Weight: 2.82 oz [80 g]
 - d. Inputs per module: 8 [sinking/ sourcing]
 - e. Operating voltage range: 12-24 VDC [\pm 10%]
 - f. Peak voltage: 26.4 VDC
5. Analog Input Modules
 - a. Model Number: P3-16AD-2
 - b. Location: Main House Mechanical Closet
 - c. Weight: 3.73 oz [105 g]
 - d. Input channels: 16
 - e. Module signal input range: 0-10 VDC
 - f. Input type: single-ended [one common]
 - g. Maximum continuous overload: \pm 100V
6. Analog Output Modules
 - a. Model Number: P3-16DA-2
 - b. Location: Main House Mechanical Closet

- c. Weight: 3.73 oz [105 g]
 - d. Output channels: 16
 - e. Module signal output range: \pm 10VDC
 - f. Output type: voltage [10mA max Current]
7. Relay Output
- a. Model Number: P3-16TR
 - b. Location: Main House Mechanical Closet
 - c. Weight: 5.64 oz [160 g]
 - d. Output channels: 16
 - e. Operating voltage range: 6.25-24 VDC [\pm 20%]
 - f. Output type: relay, form A [SPST]
8. Relay Output Modules
- a. Model Number: P3-08TRS-1
 - b. Location: Main House Mechanical Closet
 - c. Weight: 10.08 oz [286 g]
 - d. Output per module: 8 relays [non-latching]
 - e. Operating voltage Range: 6.25-24 VDC [-15% / +20%]
 - f. Output type: 4 form C [SPST-NO/NC], 4 form A [SPST-NO]

2.3 ACCESSORIES

A. Sola/Hevi-Duty 24V Power Supply

- 1. Model Number: SDP 4-24-100LT
- 2. Location: Main House Mechanical Closet
- 3. Dimensions [W x H x D]: 2-7/8" x 2-7/16" x 3-7/8" [73 mm x 75 mm x 97 mm]
- 4. Weight: 0.7 lbs [.32 kg]
- 5. Input voltage: 85-132 / 176-264 Vac, 210-376 Vdc
- 6. Input frequency: 47-63 Hz
- 7. Input current: 1.8 A / 1 A
- 8. Output current: 3.8 A
- 9. Output voltage: 24-28 Vdo

B. Sola/Hevi-Duty 12V Power Supply

- 1. Model Number: SDP-2-12-100T
- 2. Location: Main House Mechanical Closet
- 3. Dimensions [W x H x D]: 1-3/4" x 2-7/16" x 3-1/2" [45 mm x 75 mm x 91 mm]
- 4. Weight: 0.5 lbs [.23 kg]

5. Input voltage: 85-264 Vac, 90-375 Vdc
6. Input frequency: 47-63 Hz
7. Input current: 0.6 A @102 Vac, 0.33 A @ 196 Vac
8. Output current: 3-2.5 A
9. Output voltage: 10-12 V

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 25 13 00

SECTION 25 35 23: INTEGRATED AUTOMATION CONTROL DAMPERS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes the integrate automation control damper for The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Belimo
 - 43 Old Ridgebury Road
 - Danbury, CT 06810
 - Phone: 800-543-9038
 - www.belimo.us
 - 1. Available through PEXSupply.com.
 - PO Box 416
 - Farmingdale, NY 11735
 - Phone: 888-757-4774
 - www.pexsupply.com

2.2 PRODUCTS

- A. Belimo Damper
 - 1. Model Number: TF24 US
 - 2. Location: Main House Mechanical Closet
 - 3. Dimensions [W x H x D]: 6-1/4" x 3" x 3-3/8" [160 mm x 76 mm x 84 mm]
 - 4. Power supply: 24 Vac \pm 20%
 - 5. Power consumption: 2 W running, 1.3 W holding

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 25 35 23

SECTION 26 05 26: GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes grounding and bonding for the electrical systems throughout The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 26 05 33.16 - Boxes for Electrical Systems

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Arlington Industries, Inc.
 - 1 Stauffer Industrial Park
 - Scranton, PA 18517
 - Phone: 800-233-4717
 - www.aifittings.com
 - 1. Available through Consolidated Electrical Distribution.
 - 671 George Wilson Road
 - Boone, NC 28607
 - Phone: 828-264-8788
- B. IDEAL Industries, Inc.
 - Becker Place
 - Sycamore, IL 60178
 - Phone: 800-435-0705
 - www.idealindustries.com
 - 1. Available through McMaster-Carr.
 - 200 Aurora Industrial Pkwy
 - Aurora, OH 44202
 - Phone: 330-995-5500
 - www.mcmaster.com
- C. TE Connectivity
 - 1050 Westlakes Drive
 - Berwyn, PA 19312
 - Phone: 800-522-6752

www.te.com

1. Available through TE Connectivity.

2.2 PRODUCTS

A. Arlington GB5 Grounding Bridge

1. Model Number: 76095
2. Location: Outdoor Kitchen Mechanical Closet
 - a. Specifically underneath the Solarlok combiner box [Refer to Section 26 05 33.16 - Boxes for Electrical Systems] as a grounding bus bar.
 - b. For Sub-Array 3 between each series string and the Solarlok combiner box.
3. Dimensions [L x W x H]: 4-3/8" x 1-5/6" x 1-1/2"
4. Finish: zinc
5. Grounding electrode or equipment grounding conductor: #6 to #2 CU/AL

B. IDEAL Split Bolt Connector

1. Model Number: 6921K58
2. Location: Great Porch Canopy
 - a. Each solar panel will have a 'branch' ground wire; the split bolt connector will join that 'branch' ground wire to the main ground wire, which terminates at the inverter (or Solarlok combiner box for Sub-Array 3). See E-603 for grounding details.
3. Finish: copper
4. Wire range: 8 solid to 4 solid
5. Minimum tap size: 16 solid
6. Recommended torque: 165 in-lbs
7. Voltage: 600 V

C. TE Connectivity Solarlok Grounding Clip

1. Model Number: 2106831-1
2. Location: Great Porch Canopy
 - a. Specifically on each SANYO HIP 195 DA3 module frame. The 6 AWG grounding wire runs through the grounding bolt and interconnects with the wire that terminates at the inverter.
3. Dimension [Diameter]: 0.7"
4. Finish: stainless steel
5. Thread: #10-32 UNF
6. Use with wire sizes: 6 AWG, 7 or 19 stranded

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 05 26

SECTION 26 05 29: HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all pipe hangers and supports which were selected to withstand all static and dynamic loading conditions which act upon the piping system and associated equipment of The Solar Homestead. Refer to E-107 of the Construction Documents for locations of conduit where supports were used.

1.2 SYSTEM DESCRIPTION

- A. CADDY Hammer-On Z Purlin Clips: These CADDY clips are used to provide support for steel EMT located underneath each trailer.
- B. Gampak Rigid Two Hole Strap: Straps are used to provide support for steel EMT where higher load bearing supports are desired as required by the National Electrical Code.
- C. Gampak Rigid One Hole Strap: Straps are used to provide support for steel EMT where higher load bearing supports are desired as required by the National Electrical Code.

1.3 RELATED SECTIONS

- A. Section 26 05 33.13 - Conduit for Electrical Systems

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Erico International Corporation
31700 Solon Road
Solon, OH 44139
Phone: 800-252-2339
www.erico.com
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Gampak Products Corporation
4680 Shagbark Court
Brookfield, WI 53005
Phone: 262-790-4445
 - 1. Available through Consolidated Electrical Distribution.
671 George Wilson Road
Boone, NC 28607
Phone: 828-264-8788

2.2 PRODUCTS

- A. Erico CADDY Hammer-On Z Purlin Clips
 - 1. Model Number: 1238P
 - a. Location: underneath various trailers
 - b. For 1/2" conduit to Z purlin
 - 2. Model Number: 12312P
 - a. Location: underneath various trailers
 - b. For 3/4" conduit to Z purlin
 - 3. Model Number: 12316M
 - a. Location: underneath various trailers
 - b. For 1" conduit to Z purlin
- B. Gampak Electrical Metallic Tubing [EMT] Steel Straps
 - 1. Model Number: 47830
 - a. Locations: Outdoor Kitchen, Outdoor Kitchen Mechanical Closet, Electrical Closet, Main House Mechanical Closet, OM Closet 1, OM Closet 2
 - b. For 1/2" Electrical Metallic Tubing [EMT]
 - c. 2 hole strap
 - 2. Model Number: 47920
 - a. Location: Outdoor Kitchen, Outdoor Kitchen Mechanical Closet, Electrical Closet, Main House Mechanical Closet
 - b. For 1/2" Electrical Metallic Tubing [EMT]
 - c. 1 hole strap

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. "Z" Purlin Clips: Hammer on clips in order to attach conduit [Refer to Section 26 05 33.13 - Conduit for Electrical Systems] underneath trailers.

END OF SECTION 26 05 29

SECTION 26 05 33.13: CONDUIT FOR ELECTRICAL SYSTEMS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all conduit for the electrical systems used in The Solar Homestead. Refer to E-107 of the Construction Documents for exact locations of products.

1.2 SYSTEM DESCRIPTION

- A. Conduit shall be used for various circuit conductor protection underneath trailers and inside OMs where wires would be otherwise exposed.

1.3 RELATED SECTIONS

- A. Section 26 05 29 - Hangers and Supports for Electrical Systems

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Electrical Metallic Tubing
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Southwire
 - 1 Southwire Drive
 - Carrollton, GA 30119
 - Phone: 770-832-4242
 - www.southwire.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. 1/2" Electrical Metallic Tubing [EMT] [CSI 26 05 33.13.A1]
 - 1. Model Number: 101543
 - 2. Location: underneath various trailers
 - 3. Dimensions [Diameter x L]: 1/2" x 10'
 - 4. Internal diameter: 0.622"
 - 5. Wall thickness: 0.042"
 - 6. Finish: galvanized steel
- B. 3/4" Electrical Metallic Tubing [EMT] [CSI 26 05 33.13.A2]
 - 1. Model Number: 101550
 - 2. Location: underneath various trailers

3. Dimensions [Diameter x L]: 3/4" x 10'
 4. Internal diameter: 0.824"
 5. Wall thickness: 0.049"
 6. Finish: galvanized steel
- C. 1" Electrical Metallic Tubing [EMT] [CSI 26 05 33.13.A3]
1. Model Number: 101568
 2. Location: underneath Flex OM trailer
 3. Dimensions [Diameter x L]: 1" x 10'
 4. Internal diameter: 1.049"
 5. Wall thickness: 0.057"
 6. Finish: galvanized steel
- D. Southwire Liquidtight Flexible Metal Conduit [LFMC] [CSI 26 05 33.13.B1]
1. Model Number: 55082721
 2. Location: underneath various trailers
 3. Dimensions [Diameter x L]: 3/4" x 25'
 4. Internal diameter: 0.380"
 5. Finish: construction steel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 05 33.13

SECTION 26 05 33.16: BOXES FOR ELECTRICAL SYSTEMS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes junction boxes and combiner boxes used in The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Solarlok Combiner Box Assemblies: used to combine up to five strings in a pre-terminated connectorized weather-resistant enclosure to meet National Electric Code [NEC] requirements for series fusing of photovoltaic [PV] modules.
- B. Junction Box: Designed for use as wiring boxes provides protection against rain, sleet and snow in outdoor installations, or against dripping water indoors.

1.3 RELATED SECTIONS

- A. Section 26 05 26 - Grounding and Bonding for Electrical Systems
- B. Section 26 05 82 - Wiring Connections
- C. Section 26 18 16 - Medium-Voltage Fuses
- D. Section 28 31 00 - Fire Detection and Alarm

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. TE Connectivity
1050 Westlakes Drive
Berwyn, PA 19312
Phone: 800-522-6752
www.te.com
 - 1. Available through TTI, Inc.
2441 Northeast Parkway
Fort Worth, TX 76106
Phone: 877-645-4884
www.ttiinc.com
- B. Austin Electrical Enclosures
PO Box 2320
Yadkinville, NC 27055
Phone: 336-468-2851
www.austinenclosures.com

1. Available through Consolidated Electrical Distribution.
671 George Wilson Road
Boone, NC 28607
Phone: 828-264-8788
- C. Cantex Inc
301 Commerce
Suite 27000
Fort Worth, TX 76102
Phone: 817-215-7000
www.cantexinc.com
1. Available through Consolidated Electrical Distribution.
671 George Wilson Road
Boone, NC 28607
Phone: 828-264-8788
- D. Carlon
32425 Aurora Road
Suite A
Solon, OH 44139
Phone: 877-422-7566
www.carlon.com
1. Available at national chain hardware stores, such as Lowes.
- E. Allied Moulded Products, Inc.
222 North Union Street
Bryan, OH 43506
Phone: 419-636-4217
www.alliedmoulded.com
1. Available through Consolidated Electrical Distribution.
671 George Wilson Road
Boone, NC 28607
Phone: 828-264-8788
- F. RACO
3902 West Sample Street
South Bend, IN 46619
Phone: 800-722-6437

www.hubbell-raco.com

1. Available at national chain hardware stores, such as Lowes.

G. Gampak Products Corporation

4680 Shagbark Court

Brookfield, WI 53005

Phone: 262-790-4445

1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. TE Solarlok Combiner Box [CSI 26 05 33.16.A1]

1. Model Number: 408-10271
2. Location: Outdoor Kitchen Mechanical Closet
 - a. Underneath the inverter [Refer to Construction Documents on sheet E-301]
 - b. Specifically to parallel each series string of Sub-Array 3 or 18 HIP 195 DA3 modules [six panels in each series string]
3. Maximum system voltage [DC]: 600 V
4. Maximum output current [DC]: 75 A
5. Maximum input voltage [DC]: 600 V
6. Maximum input current [DC]: 15 A
7. Maximum continuous current [DC]: 60 A
8. Maximum current per string [DC]: 15 A
9. Maximum fuse rating [DC]: 15 A
10. Fuse size: 13/32" x 1-1/2" [10 mm x 38 mm] - Midget/5AG form factor [Refer to Section 26 18 16 - Medium-Voltage Fuses]
11. Weatherability enclosure type: NEMA Type 3
12. Maximum ambient temperature: 50°C

B. Austin Electrical Junction and Pull Box [CSI 26 05 33.16.B1]

1. Model Number: AB-444SB
2. Location: underneath each trailer
 - a. Underneath each trailer where vertical framing channels terminate underneath 1/2" EMT and terminate at this junction box. PV conductors routed through 1/2" EMT travel through the columns and terminate at this junction box. See E-111 for junction and pull box locations.
3. Dimensions [L x W x H]: 4" x 4" x 4"
4. Finish: galvanized steel

C. Cantex Rigid PVC Junction Box [CSI 26 05 33.16.B2]

1. Model Number: CTX-5133710

2. Location: underneath the Great Porch, Electrical Closet, Main House Mechanical Closet
 3. Dimensions [L x W x H]: 6" x 6" x 4"
 4. Weight: 2.6 lbs
 5. Weather tight
- D. Carlon Junction Box [CSI 26 05 33.16.B3]
1. Model Number: E989NL
 2. Location: Flex Bath, Electrical Closet, Outdoor Kitchen Mechanical Closet
 - a. Specifically underneath the vanity of Flex Bath.
 3. Dimensions [L x W x H]: 8" x 8" x 4"
 4. Junctions all circuits coming into the space in compliance with the NEC.
- E. Allied Moulded Residential Receptacle Boxes
1. Single Gang [CSI 26 05 33.16.C1]
 - a. Model Number: 1099-N
 - b. Location: throughout The Solar Homestead [Refer to Construction Documents on sheet E-103 for locations]
 - c. Dimensions [W x H x D]: 2-1/4" x 3-3/4" x 3-9/16"
 - d. Volume: 22.5 in³
 - e. Finish: thermoset-fiberglass
 2. Double Gang [CSI 26 05 33.16.C2]
 - a. Model Number: 2300-NK
 - b. Location: throughout The Solar Homestead [Refer to Construction Documents on sheet E-103 for locations]
 - c. Dimensions [W x H x D]: 4" x 3-3/4" x 3"
 - d. Volume: 32.5 in³
 - e. Finish: thermoset-fiberglass
 3. Three Gang [CSI 26 05 33.16.C3]
 - a. Model Number: 3300-NK
 - b. Location: throughout The Solar Homestead [Refer to Construction Documents on sheet E-103 for locations]
 - c. Dimensions [W x H x D]: 5-11/16" x 3-3/4" x 3"
 - d. Volume: 46 in³
 - e. Finish: thermoset-fiberglass
 4. Four Gang [CSI 26 05 33.16.C4]
 - a. Model Number: 4300-NK
 - b. Location: Main House Bath [Refer to Construction Documents on sheet E-103 for locations]

- c. Dimensions [W x H x D]: 7-1/2" x 3-3/4" x 3"
 - d. Volume: 60 in³
 - e. Finish: thermoset-fiberglass
 - 5. 3/0 Round Outlet
 - a. Model Number: 9335-NC2
 - b. Location: Flex Space
 - i. Specifically for smoke alarm mounting [Refer to Section 28 31 00 - Fire Detection and Alarm]
 - c. Dimensions [Diameter x L]: 3-1/2" x 2-7/8"
 - d. Volume: 20.5 in³
 - e. Finish: thermoset-fiberglass
 - f. Fixture support rating: 50 lbs
 - g. Fire rating classification: 2-HR wall and ceiling
- F. RACO 2-Gang Metal Square Electrical Box
 - 1. Model Number: 8232
 - 2. Location: Main House Kitchen, Outdoor Kitchen, OM Closets
 - 3. Dimensions [L x W x D]: 2-1/8" x 4" x 2-1/8"
 - 4. Capacity: 30.3 in³
 - 5. Fire rating in minutes: 120
- G. Gampak 2.17" Rectangle Metal Electrical Box Cover
 - 1. Model Number: 14252
 - 2. Location: OM Closet 3
 - 3. Number of gangs: 1
 - 4. Die cast construction
 - 5. Powder coated for corrosion resistance
- H. Gampak 2.29" Square Metal Electrical Box Cover
 - 1. Model Number: 14353-5
 - 2. Location: Main House Mechanical Closet, Electrical Closet, Outdoor Kitchen Mechanical Closet
 - 3. Number of gangs: 2
 - 4. Die cast construction
 - 5. Powder coated for corrosion resistance

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 05 33.16

SECTION 26 05 83: WIRING CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes wiring connections for The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. Solarlok Interconnection System: Used at the end of Sub-Array 3 conductors to 'plug' into the Solarlok Combiner box [Refer to Section 26 05 33.16 - Boxes for Electrical Systems]. See sheet E-107 and E-301 for connector and combiner box location.
- B. Multi-Contact MC3-Solarline Branch Connectors: Used to parallel the series strings from Sub-Array 1 [also applies to Sub-Array 2].
- C. Molex connectors: Used to wire circuits which cross between trailers.

1.3 RELATED SECTIONS

- A. Section 26 05 33.16 - Boxes for Electrical Systems

1.4 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. TE Connectivity
 - 1050 Westlakes Drive
 - Berwyn, PA 19312
 - Phone: 800-522-6752
 - www.te.com
 - 1. Available through TTI, Inc.
 - 2441 Northeast Parkway
 - Fort Worth, TX 76106
 - Phone: 877-645-4884
 - www.ttiinc.com
- B. Multi-Contact
 - 100 Market Street
 - Windsor, CA 95492
 - Phone: 707-838-0530
 - www.multi-contact-usa.com
 - 1. Available through Alternative Energy Engineering.
 - 1271 Evergreen Road, #1

Redway, CA 95560
Phone: 800-777-6609
www.aeesolar.com

- C. 3M
100 Market Street
Windsor, CA 95492
Phone: 707-838-0530
www.multi-contact-usa.com
1. Available through Alternative Energy Engineering.
1271 Evergreen Road, #1
Redway, CA 95560
Phone: 800-777-6609
www.aeesolar.com
- D. Molex, Inc
2222 Wellington Court
Lisle, Illinois 60532
Phone: 630-527-4561
www.molex.com
1. Available through Mouser Electronics.
1000 North Main Street
Mansfield, TX 76063
Phone: 800-346-6873
www.mouser.com

2.2 PRODUCTS

- A. TE Solarlok Interconnection System Connectors [CSI 26 05 83.A1]
1. Plus Female Connectors [CSI 26 05 83.A11]
 - a. Model Number: 4-1394462-8
 2. Minus Female Connectors [CSI 26 05 83.A12]
 - a. Model Number: 4-1394462-9
 3. Location: Outdoor Kitchen Mechanical Closet
 4. Connector: 4.0 mm²
 5. Wire size: 10 AWG, 4.5 to 6.0 mm
 6. Insulation outside diameter: 0.177 - 0.236"
- B. MC3 Cable Couplers [CSI 26 05 83.B1]

1. Female Couplers
 - a. Model Number: MC3 32.0062-10
 2. Male Couplers
 - a. Model Number: MC3 32.0063-10
 3. Location: underneath trailers, Great Porch
 - a. Specifically as a connector on each SANYO HIP 195 DA3 module.
 - b. The MC3 cable couplers are installed onto USE-2/RHW-2 cable which is used between solar modules, solar modules and MC3 branch connectors and inverters.
 4. Current: 30 A
 5. Voltage: 1000 V
- C. MC3 PV Branch Plugs [CSI 26 05 83.C1]
1. Branch Plugs: MC3 32.0009-UR
 2. Location: underneath trailer 4 and 6
 - a. Specifically in the Cantex Rigid PVC Junction Box
 - b. Used to parallel series strings from Sub-Array 1 [six modules in series per string]; also applies to Sub-Array 2
 3. Current: 30 A
 4. Voltage: 1000 V
- D. MC3 PV Branch Sockets [CSI 26 05 83.D1]
1. Model Number: MC3 32.008-UR
 2. Location: underneath trailer 4 and 6
 - a. Specifically in the Cantex Rigid PVC Junction Box
 - b. Used to parallel series strings from Sub-Array 1 [six modules in series per string]; also applies to Sub-Array 2
 3. Current: 30 A
 4. Voltage: 1000 V
- E. 3M Scotchlok Connector[CSI 26 05 83.E1]
1. Model Number: UR2
 2. Location: throughout The Solar Homestead
 - a. Specifically connects the low voltage wire to the wire from LED lighting fixture
 3. Self-stripping, insulated and moisture-resistant butt connector for 2 – or 3 wire solid copper conductor combinations of 26-19 AWG having maximum insulation O.D. of 0.082 inches.
 4. Insulation outside diameter: 0.082” [2.08 mm]
 5. PIC-unfilled: 19-26 AWG
 6. PIC-filled: 19-26 AWG

- F. Molex Connector [CSI 26 05 83.F1]
 - 1. Model Number: 0194011000
 - 2. Location: underneath trailers
 - 3. Operating temperature range: 35°C - 85°C
 - 4. Wire Size: 12 AWG, 14 AWG
 - 5. Circuit Detail: 3 circuits with ground
 - 6. Voltage: 300 V
 - 7. Current: 20 A

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 05 83

SECTION 26 09 13: ELECTRICAL POWER MONITORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the electrical power monitoring used throughout The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. TED The Energy Detective
 - 648 Marina Drive
 - Charleston, SC 29492
 - Phone: 800-959-5833
 - www.theenergydetective.com
 - 1. Available through TED The Energy Detective.

2.2 PRODUCTS

- A. TED 5004-C with Google PowerMeter
 - 1. Model Number: 5004-C
 - 2. Location: Electrical Closet
 - 3. 1 gateway embedded with footprints software
 - 4. 4 measuring transmitting units/current transformers [in the Electrical Closet]

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 09 13

SECTION 26 09 23: LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all lighting control devices, such as dimmer switches, single pole switches, and three way switches, used throughout The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Lutron Electronics, Inc
7200 Suter Road
Coopersburg, PA 18036-1299
Phone: 610-282-3800
www.lutron.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Lutron Magnetic Low Voltage Dimmer
 - 1. Model Number: DVLV-600P [-WH, -GR]
 - 2. Location: interior white walls [-WH], interior wooden surfaces [-GR]
 - 3. Finish: white, gray
 - 4. Wattage: 450 W
 - 5. Voltage: 120 V
 - 6. Load rating: 600 VA
- B. Lutron Magnetic Low Voltage 3 Way Dimmer
 - 1. Model Number: DVLV-603P-WH
 - 2. Location: interior white walls
 - 3. Finish: white
 - 4. Wattage: 450 W
 - 5. Voltage: 120 V
 - 6. Load Rating: 600 VA
- C. Lutron Single Pole Switch
 - 1. Model Number: CA-1PSH [-WH, -GR]
 - 2. Location: interior white walls and Core Bath [-WH], Main House wooden surfaces [-GR]

3. Finish: white, gray
4. Voltage: 120 V
5. Current: 15 A
6. Load Rating: 120/277 VAC
7. Frequency: 60 Hz

D. Lutron Three Way Switch

1. Model Number: CA-3PSH [-WH, -GR]
2. Location: interior white walls [-WH], Main House wooden surfaces [-GR]
3. Finish: white, gray
4. Voltage: 120 V
5. Current: 15 A
6. Load Rating: 120/277 VAC, 60 Hz

1.3 ACCESSORIES

A. Lutron 1 Gang Wall Plate

1. Model Number: CW-1 [-WH, -GR]
2. Location: interior white walls [-WH], interior gray walls [-GR]
3. Finish: white, gray

B. Lutron 2 Gang Wall Plate

1. Model Number: CW-2-WH
2. Location: interior white walls
3. Finish: white

C. Lutron 3 Gang Wall Plate

1. Model Number: CW-3-WH
2. Location: interior white walls
3. Finish: white

D. Lutron 4 Gang Wall Plate

1. Model Number: CW-4-WH
2. Location: interior white walls
3. Finish: white

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 09 23

SECTION 26 22 16: LOW-VOLTAGE BUCK-BOOST TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the low-voltage buck-boost transformers used throughout The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Elemental LED
 - 1195 Park Ave. Ste. 211
 - Emeryville, CA 94608
 - Phone: 877-564-5051
 - www.elementaled.com
 1. Available through Elemental LED.

2.2 PRODUCTS

- A. Elemental LED Dimmable Driver
 1. Model Number: EL-TMDRVR
 2. Input: 120 Vac
 3. Output: 12 Vdc
 4. Frequency: 60 Hz
 - a. EL-20WDIM
 - i. Dimensions [L x W x D]: 5-1/2" x 2" x 1-1/2"
 - ii. Weight: 1 lb 8 oz
 - iii. Wattage: 20 W
 - b. EL-60WDIM
 - i. Dimensions [L x W x D]: 8-1/2" x 3" x 3"
 - ii. Weight: 4 lb 1 oz
 - iii. Wattage: 60 W
 - c. EL-100WDIM
 - i. Dimensions [L x W x D]: 9" x 3" x 3"
 - ii. Weight: 5 lb 12 oz
 - iii. Wattage: 100 W
- B. Elemental LED Non-Dimmable Driver

1. Model Number: EL-12VDRVR
 - a. Dimensions [L x W x D]: 6-1/2" x 1-1/8" x 1-3/4"
 - b. Weight: 22 oz
 - c. Wattage: 60 W
 - d. Input voltage: 100 V - 240 Vac
 - e. Input current: 0.55 A
 - f. Output voltage: 12 Vdc
 - g. Current: 1.67 A

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 22 16

SECTION 26 24 16: PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes all panelboards in The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. The Eaton Cutler Hammer Combination Meter Breaker Panel functions as the main panelboard in the Electrical Closet, where the utility service drop will occur.
- B. The Square D Indoor Main Breaker Load Center functions as the second panelboard or 'sub-panel' in the Main House and serves the house circuits.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Eaton Cutler Hammer
1000 Cherrington Parkway
Moon Township, PA 15108
Phone: 412-898-3330
www.cutler-hammer.eaton.com
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Square D
128 Bingham Rd.
Asheville, NC 28806
Phone: 828-255-1537
www.schneider-electric.us
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCT

- A. Eaton Cutler Hammer Combination Meter Breaker Panel [CSI 26 24 16.A1]
 - 1. Model Number: CMB2436B200BTS
 - 2. Location: Electrical Closet
 - 3. Dimensions [W x H x D]: 14-7/16" x 32-3/8" x 5-3/8" [367 mm x 823 mm x 137 mm]
 - 4. Jaws: 4
 - 5. Distribution: 24/36
 - 6. Ringless all-in-one

7. 150 A main breaker
 8. 10000 AIC
 9. Current: 200 A
- B. Square D Indoor Main Breaker Load Center [CSI 26 24 16.A2]
1. Model Number: HOM3040M150VP
 2. Location: North Hall
 3. Dimensions [W x H x D]: 16" x 35-7/8" x 5-3/8"
 4. Finish: gray
 5. Number of spaces: 30
 6. Circuits: 40
 7. Current: 150 A

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 24 16

SECTION 26 27 26: WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. *One component within this section is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead. Refer to the Southwire Aluminum SER Cable.*
- B. This section includes all the wiring and wiring devices used in The Solar Homestead. Refer to E-604 of the Construction Documents for exact locations of products.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Southwire
 - 1 Southwire Drive
 - Carrollton, GA 30119
 - Phone: 770-832-4242
 - www.southwire.com
 1. Available at national chain hardware stores, such as Lowes.
- B. Cerro Wire
 - 1099 Thompson Road, SE
 - Hartselle, AL 35640
 - Phone: 800-523-3869
 - www.cerrowire.com
 1. Available at national chain hardware stores, such as Lowes.
- C. TE Connectivity
 - 300 Constitution Drive
 - Menlo Park, CA
 - Phone: 650-361-3333
 - www.te.com
 1. Available through TE Connectivity.

2.2 PRODUCTS

- A. Romex SIMpull NM-B [CSI 26 27 26.A1]
 1. 12-3-NM-B-W
 - a. Model Number: 63947655

- b. Location: Flex OM, Main House
 - c. Maximum current: 20 A
 - d. Voltage: 600 V
 - e. Number of conductors: 3
2. 12-2-NM-B
 - a. Model Number: 28828269
 - b. Location: Flex OM, Main House
 - c. Maximum current: 20 A
 - d. Voltage: 600 V
 - e. Number of conductors: 3
3. 14-2-NM-B
 - a. Model Number: 28827469
 - b. Location: Flex OM, Main House
 - c. Maximum current: 15 A
 - d. Voltage: 600 V
 - e. Number of conductors: 3
4. 10-3-NM-B
 - a. Model Number: 63948426
 - b. Location: Flex OM, Main House
 - c. Maximum current: 30 A
 - d. Voltage: 600 V
 - e. Number of conductors: 3
5. 8-3-NM-B
 - a. Model Number: 63949221
 - b. Location: Flex OM, Main House
 - c. Maximum current: 40 A
 - d. Voltage: 600 V
 - e. Number of conductors: 3
6. 6-3-NM-B
 - a. Model Number: 147-4203B
 - b. Location: Main House
 - c. Maximum current: 55 A
 - d. Voltage: 600 V
 - e. Number of conductors: 3

- B. Romex SIMPull THHN/THWN-2
 - 1. Grounding Wire [CSI 26 27 26.B1]
 - a. Model Number: 28894405
 - b. Location: Great Porch Canopy
 - i. Grounding wire which runs through each solar panel ground bolt. This grounding wire terminates at the inverter for each Sub-Array.
 - c. Wire gauge: 6 AWG
 - d. Type: stranded 19
 - e. Nominal outside diameter: 249 mils
 - f. Temperature rating: 167°F
 - g. Finish: green jacket nylon
 - h. Maximum current: 65 A
 - i. Voltage: 600 V
 - 2. Conductor run through EMT and LFMC [CSI 26 27 26.B2]
 - a. Location: Outdoor Kitchen Mechanical Closet, Electrical Closet, underneath various trailers
 - b. Wire gauge: 6 AWG
 - i. Type: stranded 19
 - ii. Nominal outside diameter: 249 mils
 - iii. Allowable ampacity at 75°C: 65 A
 - c. Wire gauge: 8 AWG
 - i. Type: stranded 19
 - ii. Nominal outside diameter: 213 mils
 - iii. Allowable ampacity at 75°C: 50 A
 - d. Wire gauge: 10 AWG
 - i. Type: stranded 1
 - ii. Nominal outside diameter: 150 mils
 - iii. Allowable ampacity at 75°C: 30 A
 - e. Wire gauge: 12 AWG
 - i. Type: stranded 1
 - ii. Nominal outside diameter: 119 mils
 - iii. Allowable ampacity at 75°C: 30 A
 - f. Wire gauge: 14 AWG
 - i. Type: stranded 19
 - ii. Nominal outside diameter: 161 mils

- iii. Allowable ampacity at 75°C: 15 A
- C. Southwire Aluminum SER Cable [CSI 26 27 26.C1]
1. Location: underneath various trailers
 - a. Specifically for use as the house feeder cable from the main panelboard and sub-panel.
 2. Dimensions [Diameter]: 1168 mils
 3. Conductor size: 1/0-1/0-1/0-2
 4. Stranding 10
 5. Allowable ampacities: 60C 100, 75C 120, 90C 135
 6. Sunlight resistant
- D. Southwire Aluminum SER Cable [CSI 26 27 26.C2]
1. Location: underneath various trailers
 - a. Specifically for use as the main feeder cable from the organizer utility panel to The Solar Homestead main panel.
 - b. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
 2. Dimensions [Diameter]: 1503 mils
 3. Conductor size: 4/0-4/0-4/0-2/0
 4. Stranding 19
 5. Allowable ampacities: 60C 150, 75C 180, 90C 205
 6. Sunlight resistant
- E. Southwire Thermostat Wire [CSI 26 27 26.D1]
1. Model Number: 64162143
 2. Location: Main House, Flex OM
 - a. Used for various circuits where LEDs are used. This low voltage wire is used between drivers and the LED lights
 3. Dimensions [Diameter]: 132 mils
 4. Jacket thickness: 14 mils
 5. Conductor size: 18 AWG
 6. Number of conductors: 2
 7. Conductor colors: red, white
 8. Allowable ampacities: 60C
 9. Voltage: 150 V
 10. Sunlight resistant
 11. Can be used in temperatures up to 140°F
- F. TE Connectivity USE-2/RHW-2 [CSI 26 27 26.E1]

1. Model Number: 1986164
 - a. Location: Great Porch Canopy
 - i. Specifically for wiring the photovoltaic power system
 - b. Wire size: 10 AWG
 - c. Marking: XHHW-2 or XHH or RHW-2 or RHH SR or USE-2 Sunlight Resistant (UL
 - d. Voltage: 600 V
2. Model Number: 1986165
 - a. Location: Great Porch Canopy
 - i. Specifically for wiring the photovoltaic power system
 - b. Wire size: 12 AWG
 - c. Marking: XHHW-2 or XHH or RHW-2 or RHH SR or USE-2 Sunlight Resistant (UL
 - d. Voltage: 600 V

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Southwire Aluminum SER Cable: Installed in accordance with the NEC and Solar Decathlon 2011 Building Code, this cable will be hung with supports underneath applicable trailers. This cable will be temporarily installed during the competition and removed for transport. Refer to E-101 of Construction Documents for installation route.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 27 26

SECTION 26 28 13: FUSES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the medium-voltage fuses used throughout The Solar Homestead.

1.2 RELATED SECTIONS

- A. Section 26 05 33.16 - Boxes for Electrical Systems

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Littlefuse

8755 West Higgins Road

Suite 500

Chicago, IL 60631

Phone: 733-628-1000

www.littlefuse.com

- 1. Available through McMaster-Carr.

200 Aurora Industrial Pkwy

Aurora, OH 44202

Phone: 330-995-5500

www.mcmaster.com

2.2 PRODUCTS

- A. Midget 5AG

- 1. Model Number: 4397K312

- 2. Location: Electrical Closet

- a. Specifically used to fuse series strings of Sub-Array 3 in the Solarlok Combiner Box

- 3. Dimensions [L x W]: 13/32" x 1-1/2" [10 mm x 38 mm]

- 4. AC interrupt-current: 10,000 A for 250 Vac fuses, 100,000 A for 600 Vac fuses

- 5. DC interrupt-current: 10,000 A

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 28 13

SECTION 26 28 16.13: ENCLOSED CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes circuit breakers used in The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. The Eaton Cutler-Hammer 30 amp 3/4 in single-pole type CH circuit breaker protects home wires from overheating or causing a short-circuit. The circuit breaker is 3/4 in. wide and trips to the off position. The UL-listed breaker is compatible with Cutler-Hammer type CH load centers and has a maximum load of 240 volts.
- B. The Square D QO Circuit Breaker is a plug-in branch circuit breaker that provides overload protection in QO load centers and enclosures.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Eaton Cutler Hammer
1000 Cherrington Parkway
Moon Township, PA 15108
Phone: 412-898-3330
www.cutler-hammer.eaton.com
 - 1. Available at national chain hardware stores, such as Lowes
- B. Square D
128 Bingham Rd.
Asheville, NC 28806
Phone: 828-255-1537
www.schneider-electric.us
 - 1. Available through Consolidated Electrical Distribution.
671 George Wilson Road
Boone, NC 28607
Phone: 828-264-8788

2.2 PRODUCTS

- A. Eaton Cutler Hammer CH Branch Breaker Type
 - 1. CH Combination Arc Fault Circuit Breakers
 - a. Model Number: CH120CAFCS
 - i. Poles: 1

- ii. Current: 20 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - 2. CH Circuit Breakers
 - a. Model Number: CH115
 - i. Poles: 1
 - ii. Current: 15 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - b. Model Number: CH120
 - i. Poles: 1
 - ii. Current: 20 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - c. Model Number: CH215
 - i. Poles: 2
 - ii. Current: 15 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - d. Model Number: CH220
 - i. Poles: 2
 - ii. Current: 20 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - e. Model Number: CH230
 - i. Poles: 2
 - ii. Current: 30 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
- B. Square D QO Circuit Breaker
 - 1. QO Arc-D-tect Arc Fault Circuit Breakers
 - a. Model Number: QO115AFI
 - i. Poles: 1
 - ii. Current: 15 A

- iii. Voltage: 120 V
 - iv. AIR: 10 k
 - b. Model Number: Q0120AFI
 - i. Poles: 1
 - ii. Current: 20 A
 - iii. Voltage: 120 V
 - iv. AIR: 10 k
- 2. QO Breakers
 - a. Model Number: Q0115CP
 - i. Poles: 1
 - ii. Current: 15 A
 - iii. Voltage: 120 V
 - iv. AIR: 10 k
 - v. Thermal-magnetic tripping mechanism
 - vi. Visi-Trip indicator
 - b. Model Number: Q0120CP
 - i. Poles: 1
 - ii. Current: 20 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - v. Thermal-magnetic tripping mechanism
 - vi. Visi-Trip indicator
 - c. Model Number: Q0220CP
 - i. Poles: 2
 - ii. Current: 20 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - v. Thermal-magnetic tripping mechanism
 - vi. Visi-Trip indicator
 - d. Model Number: Q0230CP
 - i. Poles: 2
 - ii. Current: 30 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k

- v. Thermal-magnetic tripping mechanism
- vi. Visi-Trip indicator
- e. Model Number: Q0240CP
 - i. Poles: 2
 - ii. Current: 40 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - v. Thermal-magnetic tripping mechanism
 - vi. Visi-Trip indicator
- f. Model Number: Q0260CP
 - i. Poles: 2
 - ii. Current: 60 A
 - iii. Voltage: 120/240 V
 - iv. AIR: 10 k
 - v. Thermal-magnetic tripping mechanism
 - vi. Visi-Trip indicator

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 28 16.13

SECTION 26 30 00: FACILITY ELECTRICAL, POWER GENERATING, AND STORING EQUIPMENT**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all receptacles used throughout The Solar Homestead.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Lutron Electronics, Inc
7200 Suter Road
Coopersburg, PA 18036-1299
Phone: 877-610-7410

- 1. Available at national chain hardware stores, such as Lowes.

- B. Cooper Industries
600 Travis Street, Suite 5600
Houston, TX 77002-1001

- 1. Available at national chain hardware stores, such as Lowes.

- C. TayMac Corporation
1343 North Tech Blvd.
Gilbert, AZ 85233

- 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Lutron Duplex Receptacle [CSI 26 30 00.A1]

- 1. Model Number: CAR-15H [-WH, -GR]
- 2. Location: interior white walls [-WH], Main House interior wooden surfaces [-GR]
- 3. Finish: white, gray
- 4. Voltage: 125 V
- 5. Current: 15 A

- B. Lutron Duplex GFCI Receptacle [CSI 26 30 00.A2]

- 1. Model Number: CAR-15-GFTRH[-WH, -GR]
- 2. Location: Core Module Bath, Living Module, Outdoor Kitchen, and Flex OM
- 3. Finish: white, gray
- 4. Voltage: 125 V

5. Current: 15 A
- C. Cooper Industries GFCI Receptacle [CSI 26 30 00.A4]
 1. Model Number: TWRGF15GY
 2. Location: exterior locations of The Solar Homestead
 3. Finish: gray
 4. Voltage: 125 V
 5. Current: 15 A

2.3 ACCESSORIES

- A. Lutron 1 Gang Wall Plate
 1. Model Number: CW-1 [-WH, -GR]
 2. Location: interior white walls [-WH], Main House wooden surfaces [-GR]
 3. Finish: white, gray
- B. Lutron 2 Gang Wall Plate
 1. Model Number: CW-2 [-WH, -GR]
 2. Location: interior white walls [-WH], Main House wooden surfaces [-GR]
 3. Finish: white, gray
- C. Lutron 3 Gang Wall Plate
 1. Model Number: CW-3-WH
 2. Location: interior white walls
 3. Finish: white
- D. Lutron 4 Gang Wall Plate
 1. Model Number: CW-4-WH
 2. Location: interior white walls
 3. Finish: white
- E. TayMac GFCI Receptacle
 1. Model Number: ML450G
 2. Location: exterior locations of The Solar Homestead
 3. Finish: gray

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 30 00

SECTION 26 31 00: PHOTOVOLTAIC COLLECTORS**PART 1- GENERAL**

1.1 SUMMARY

- A. This section includes the photovoltaic collectors for The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. The Photovoltaic Collectors, or Solar Panels, are to be installed on the Great Porch Canopy to collect solar power and convert that energy into energy that is to be used by the house.
 - 1. Performance Requirements: Peak power and designed for optimal use with grid-tied applications; compliance with NEC 2008

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Sanyo
 - 550 S. Winchester Blvd
 - Suite 510
 - San Jose, CA 95128
 - Phone: 408-557-4083
 - www.us.sanyo.com
- 1. Available through Graybar Electric Company.
 - 2755 Peters Creek Parkway
 - Winston-Salem, NC 27127
 - Phone: 336-724-2461
 - www.graybar.com

2.2 PRODUCT

A. Sanyo Bifacial Photovoltaic Module

1. Model Number: HIP 195DA3

| Array Number | Number of Panels | Number of Parallel Strings | Number of Panels/String | DC Rating of Array | | CSI Number |
|--------------------|------------------|----------------------------|-------------------------------|--------------------|-------------|-------------|
| | | | | In series | In parallel | |
| Sub-Array 1 | 12 panels | 2 parallel string | 6 panels in series per string | 482 Voc | 15.5 Isc | 26 31 00.A1 |
| Sub-Array 2 | 12 panels | 2 parallel string | 6 panels in series per string | 482 Voc | 15.5 Isc | 26 31 00.A2 |
| Sub-Array 3 | 18 panels | 3 parallel string | 6 panels in series per string | 482 Voc | 23.3 Isc | 26 31 00.A3 |

2. Total DC power of all arrays is 8.2 kW or up to 10.5 kW, which includes 30% reflected irradiation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 31 00

SECTION 26 51 13: INTERIOR LIGHTING FIXTURES, LAMPS, AND BALLASTS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes lighting for the Main House and Flex OM. Refer to electrical drawings and lighting schedule for details.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Super Bright LEDs, Inc.
4400 Earth City Expressway
St. Louis, MO 63045-1328
Phone: 866-590-3533
www.superbrightleds.com
 - 1. Available through Super Bright LEDs, Inc.
- B. Elemental LED
1195 Park Ave. Ste. 211
Emeryville, CA 94608
Phone: 877-564-5051
www.elementaled.com
 - 1. Available through Elemental LED.
- C. Sylvania
100 Endicott Street
Danvers, MA 01923
Phone: 978-777-1900
www.sylvania.com
 - 1. Available at national chain hardware stores, such as Lowes.
- D. American Fluorescent Corporation
2345 North Ernie Krueger Circle
Waukegan, IL 60087
Phone: 800-873-2326
www.americanfluorescent.com
 - 1. Available at national chain hardware stores, such as Lowes.
- E. Metalux

1121 Highway 74 South
Peachtree City, GA 30269
Phone: 770-486-4800
www.cooperindustries.com

1. Available at national chain hardware stores, such as Lowes.

F. Birchwood Lighting Inc.
1302 East Hunter Avenue
Santa Ana, CA 92705
Phone: 714-550-7118
www.birchwoodlighting.com

1. Available through Birchwood Lighting Inc.

G. Delray Lighting INC
7545 North Lockheed Drive
Burbank, CA 91505
Phone: 818-767-3793
www.delraylighting.com

1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

A. Super Bright LEDs LED Strip

1. Model Number: NFLS-WW3000
2. Location: Living Module, Hallways, Bedroom Module
3. Wattage: 0.95 per foot W
4. Voltage: 12 V

B. Elemental LED

1. LED Light Puck
 - a. Model Number: EL-DIM3WCREE
 - b. Location: Bay Window, Living Module, Bedroom Module, Flex Space
 - c. Wattage: 3.6 W
 - d. Voltage: 12 V
2. LED 24" Light Bar
 - a. Model Number: EL-BRTWPBAR
 - b. Location: Flex Bath
 - c. Wattage: 3.6 W
 - d. Voltage: 12 V

- C. Sylvania
 - 1. 18" T8 Linear Fluorescent Strip
 - a. Model Number: 21656
 - b. Location: Core Module, Bedroom Closets, Main House Mechanical Closet, Laundry Closet
 - c. Wattage: 15 W
 - d. Fixture: American Fluorescent- ST115
 - 2. 48" T8 Linear Fluorescent Strip
 - a. Model Number: 22062
 - b. Location: Core Bath
 - c. Wattage: 30 W
 - d. Fixture: Brandi-BRAT5-TDEC
 - 3. 48" T5 Linear Fluorescent Strip
 - a. Model Number: 20975
 - b. Location: Core Bath
 - c. Wattage: 28 W
 - d. Fixture: Del-Ray- SW54128
 - 4. 24" T8 Linear Fluorescent Strip
 - a. Model Number: 22405
 - b. Location: Core Module
 - c. Wattage: 15 W
 - d. Fixture: Metalux-SSF Series, Brandi- BRAT5- TDEC

2.3 ACCESSORIES

- A. American Fluorescent 18" Utility Fluorescent Strip Light Fixture
 - 1. Model Number: ST115
- B. Metalux 24" Utility Fluorescent Strip Light Fixture
 - 1. Model Number: SNF-120-LTS-120V-U
- C. Birchwood Brandi 48" Fixture
 - 1. Model Number: BRA T8 TDEC ACC 120 EB 132 BK AS
 - 2. Location: Core Bath
- D. Delray Lighting Fixture
 - 1. Model Number: SW54128
 - 2. Location: Core Bath

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Install in accordance with NEC 110, NEC 690, and all other relevant sections.
- C. Install lighting equipment in accordance with required clearances.
- D. Install lighting to allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
- E. Install lighting to provide for ease of disconnecting the equipment with minimum interference to other installations.

END OF SECTION 26 51 13

SECTION 26 56 00: EXTERIOR LIGHTING**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes exterior lighting within site walls, on top of OM Closets, within columns of the Great Porch and within Outdoor Kitchen. Refer to electrical drawings and lighting schedule for details.

1.2 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. General Electric Company
3135 Easton Turnpike
Fairfield, CT 06828
Phone: 800-435-4448
www.gelighting.com
 - 1. Available at national chain hardware stores, such as Lowes.
- B. Elemental LED
1195 Park Ave. Ste. 211
Emeryville, CA 94608
Phone: 877-564-5051
www.elementalled.com
 - 1. Available through Elemental LED.
- C. Lighting Ever
Sahara Executive Suites
1810 E Sahara Ave, # 100
Las Vegas, NV 89104
Phone: 888-736-9988
www.lightingever.com
 - 1. Available at Lighting Ever.
- D. HADCO
100 Craftway Drive
Littlestown, PA 17340
Phone: 800-331-4185
www.hadco.com

1. Available at HADCO.

E. Birchwood Lighting Inc.
1302 East Hunter Avenue
Santa Ana, CA 92705
Phone: 714-550-7118
www.birchwoodlighting.com

1. Available through Birchwood Lighting Inc.

2.2 PRODUCT

A. General Electric

1. 24" T8 Linear Fluorescent

- a. Model Number: 64234
- b. Location: OM Closets, Outdoor Kitchen Mechanical Closet, Electrical Closet
- c. Wattage: 18 W
- d. Fixture: BRA T8 TDEC ACC 120 EB 132 BK AS

2. LED Flood Light

- a. Model Number: 71776
- b. Location: on top of OM Closets and Flex OM
- c. Wattage: 26 W
- d. Fixture: HADCO Floodlight Fixture

B. Elemental LED

1. LED Light Puck

- a. Model Number: EL-DIM3PKKT
- b. Location: Outdoor Kitchen
- c. Wattage: 3.6 W
- d. Voltage: 12 V

2. LED 24" Light Bar

- a. Model Number: EL-BRTWPBAR
- b. Location: within Site Walls
- c. Wattage: 3.6 W
- d. Voltage: 12 V

C. Lighting Ever LED Flexible Lighting Strips

1. Model Number: 3258-SMD-LED
2. Location: within columns on Great Porch

2.3 ACCESSORIES

- A. HADCO Floodlight Fixture
 - 1. Model Number: BW4 AS
 - 2. Location: on top of OM Closets and Flex OM
- B. Birchwood Lighting 24" Wet Location Luminaire
 - 1. Model Number: BRA T8 TDEC ACC 120 EB 117 BK AS
 - 2. Location: OM Closets, Outdoor Kitchen Mechanical Closet, Electrical Closet

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 26 56 00

SECTION 28 31 00: FIRE DETECTION AND ALARM**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all of the electronic equipment that provides fire detection within The Solar Homestead.
- B. Installation will be approved and inspected by authorities having discretion Elm Engineering.
- C. This system uses a non-coded, hardwired, zoned and battery back-up smoke detectors coupled with a fire-suppression system utilizing sprinkler heads. The sprinkler heads and smoke detectors work independently of one another.

1.2 SUBMITTALS TO AUTHORITIES HAVING JURISDICTION

- A. Submittal to Boone, NC Fire Department for inspection and approval.

1.3 SUBMITTALS

- A. Smoke Alarm Product Specification Sheet
- B. Smoke Alarm Wiring Diagram
- C. All Submittals have been tested by [UL] and are listed and labeled.
- D. All electrical components of fire-suppression and detection system are listed and labeled as defined as pursuant to the NFPA 70, by a qualified testing agency and located as determined by design.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. First Alert, Inc.
3901 Liberty Street Road
Aurora, IL 60504
Phone: 630-851-7330
www.firstalert.com
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. First Alert Ionization Smoke Alarm
 - 1. Model Number: 9120B
 - 2. Location: Main House and Flex Space
 - 3. Dimensions [L x W x H]: 5-3/4" x 2-1/4" x 5-1/2"
 - 4. 9V battery back-up
 - 5. 75dBa alarm
 - 6. Voltage: 120 Vac
 - 7. Current: 0.04 A
 - 8. Frequency: 60 Hz

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The smoke detection systems will be installed pursuant to [NFPA] 13D regulations as well as [IRC] section P2904. The system will be tested and inspected by local authorities having jurisdiction in this matter.
- B. Install in accordance with manufacturer's recommendations.

END OF SECTION 28 31 00

SECTION 32 93 00: PLANTS**PART 1 - GENERAL**

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section includes all plants that will be located on The Solar Homestead site. Refer to plant schedule [L-105 and L-106] in Construction Documents for specific plant species and locations.

1.2 RELATED SECTIONS

- A. Section 32 94 00 - Planting Accessories

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. NorthCreek Nursery
388 North Creek Road
Landenberg, PA 19350
Phone: 877-326-7584
www.northcreeknurseries.com
 - 1. Available through NorthCreek Nursery.
- B. Marshall's Farm
23511 US Hwy 80 East
Statesboro, GA 30461
Phone: 912-601-2338
www.gogardennow.com
 - 1. Available through Marshall's Farm.
- C. HLG Growers
PO Box 1366
Boone, NC 28607
Phone: 828-964-6905
www.hlggrowers.com
 - 1. Available through HLG Growers.
- D. Plant seeds
 - 1. Available at national chain hardware stores, such as Lowes.

2.2 PRODUCTS

- A. Marshall's Farm Sedums

1. Sedum sarmentosum, also known as “yellow moss”
 2. Sedum makinoi, also known as “limelight”
- B. NorthCreek Nursery Sedums
1. Sedum makinoi, also known as “limelight”
- C. HLG Growers Sedums
1. Sedum sarmentosum, also known as “yellow moss”
- D. Plant seeds
1. Includes all flowers and edible plants.
 2. Refer to plant schedule in Construction Documents.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. Watering
1. Green Roof Plants: Water evenly when first planted with 65 gallons of water. Water again two weeks after arriving at the National Mall if needed.
 2. Plants in straw bales: Water each plant with .623 gallons of water each week. Fully saturate straw bales when they are first placed on the National Mall.
- B. Transportation: All plants are to be transported in a conditioned flower truck. The straw bales are to be transported in separate covered trailers to Washington DC.

3.2 INSTALLATION

- A. To plant vegetables in straw bales [Refer to Section 32 94 00 - Planting Accessories], cut out 2 – 8' x 8' squares with a 4" depth. Fill the area with soil mix. Spread root ball of plant and insert in soil. Lay an inch of compost around plant. Saturate soil.

END OF SECTION 32 93 00

SECTION 32 94 00: PLANTING ACCESSORIES**PART 1 - GENERAL**

1.1 SUMMARY

- A. *This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability contest of The Solar Homestead.*
- B. This section describes the straw bales used on the site of The Solar Homestead.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Straw bales
 - 1. Available at national chain farm supply stores.

2.2 PRODUCTS

- A. Straw bales
 - 1. Dimensions: 36" x 18" x 14"

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE & HANDLING

- A. Transportation: The straw bales are to be transported in covered trailers to Washington DC.

3.2 INSTALLATION

- A. Refer ground cover plan [L-102] of the Construction Documents for the layout of the straw bales.

END OF SECTION 32 94 00

SECTION 48 19 16: ELECTRICAL POWER GENERATOR INVERTERS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section includes all information for the photovoltaic power system inverters for The Solar Homestead.

1.2 SYSTEM DESCRIPTION

- A. The Photovoltaic Inverters are to be installed in the OMs to convert the solar energy into energy that is to be used by the house; to invert direct current to alternating current.

1.3 SUBMITTALS

- A. Product Data

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kaco
38 Keyes Avenue
Suite 102
San Francisco, CA, 94129
Phone: 415-931-2046
www.kaco-newenergy.com
1. Available through Graybar Electric Company.
2755 Peters Creek Parkway
Winston-Salem, NC 27127
Phone: 336-724-2461
www.graybar.com

2.2 PRODUCT

- A. Kaco Grid-Tied Inverter

| Inverter Manufacturer | Model Number | Voltage | Rating [kVA or KW] | CSI Number |
|-----------------------|-------------------|---------|--------------------|-------------|
| KACO | blueplanet 2502xi | 550 | 2.5 KW | 48 19 16.A1 |
| KACO | blueplanet 5002xi | 600 | 5 KW | 48 19 16.A2 |

1. Location: OM Closet 1, OM Closet 3, Outdoor Kitchen Mechanical Closet
2. Compliant with UL 1741, IEEE 1547, CSA 22.2 C US

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.

END OF SECTION 48 19 16



A **STRUCTURAL CALCULATIONS**



March 22, 2011

Mr. Travis McKenzie
Solar Decathlon Team Project Manager
The Solar Homestead
Appalachian State University
1100 E. King Street
Boone, North Carolina 28607

Re: ASU Solar Homestead Structural Review

I have reviewed the structural elements for the subject project. For the most part, the structure is designed and built according to the North Carolina Building Code: Residential Code 2009 (2006 IRC with North Carolina Amendments). I have identified some specific portions of the design that are beyond the scope of the code. I have also attached calculations regarding the specific components:

- 1) The main canopy rail (Page 1 of the calculation set) is a steel member with significant cantilever sections. The calculations are based on the steel alone and not on the associated pressure treated façade elements.
- 2) The canopy columns are steel and consist of two different steel tubular members that slide into each other. I have based the calculations on the smaller of the members with the natural assumption that the larger will have a larger structural capacity. The first check was for the effective length with the column strength (Page 2). The other concern was the moment associated with wind force (Page 3). The calculations are modified from component and cladding calculations.
- 3) The typical beam for the trailer (Page 4) was checked for the worst case scenario. The channel section was adequate when total loading and moments were considered.
- 4) The design calls for 3 bolts in each column to support the canopy sections. I verified the capacity of the ½” bolts and the resulting safety factor (Page 6)
- 5) The jacks are designated for a capacity of 7500 pounds each. I verified that under dead load situations, the jacks can provide the proper lifting capacity for the worst case scenario (Page 6). I will assume the jacks will not be engaged when the floors are fully loaded with people or when the roof is fully loaded with snow.

The design calls for a few other specific elements that are not conventional. The floor sheathing for the main house section consists of two layers of ¾” plywood laid with one layer opposed to the other. The plywood should also be staggered in accordance with Figure R502.2 of the North Carolina Building Code: Residential Code 2009. This is in order to accommodate the 24”o.c. floor framing and prevent

excessive deflection during the Solar Decathlon event. Please note that I did not review the shop fabricated wood trusses that are indicated on sheet S-104. They are the responsibility of another party.

The design is specifically for the Solar Decathlon event for the fall of 2011. In the interest of sustainability, the calculations I have performed have been based on the reuse of the home after the event in the local area. For design purposes, I have applied the following loads:

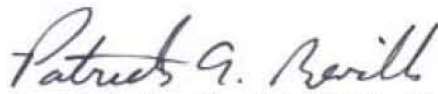
Roof Live Load: 35 PSF (Snow Load)
Roof Dead Load: 15 PSF
Floor Live Load: 40 PSF
Floor Dead Load: 15 PSF
Design Wind Speed: 120 MPH

Additionally, the design has to consider many different phases of loading. The structure will be transported on the indicated trailers with the canopies lowered. The structure will then be set up in the fall of 2011 in Washington DC for the competition with the canopies raised as indicated. The structure will then be transported back to the local area and set up on a traditional foundation which will have to be a site specific design.

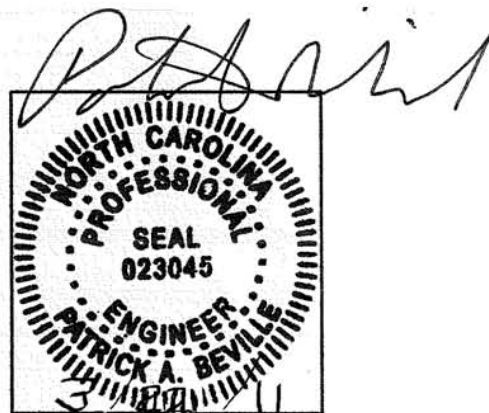
The designs are adequate for all of the various phases of the project. I have based my review on the 100% Construction Documents dated March 22, 2010 with the following pages: S-101 thru S-106, S-401, S-501 thru S-505 (less S-503), and Z-101 thru Z-110. Any other aspects of the design are presumed to meet North Carolina Building Code: Residential Code 2009 (2006 IRC with North Carolina Amendments).

Please let me know if you need any other information.

Sincerely,



Patrick A. Beville, PE, LEED AP
(PE License NC 023045)
Principal, IONCON NC License # P-0820



SHEET 1 OF 6 DRAWN BY PAB
 DATE 3/2/11 CONTACT _____
 CUSTOMER NAME ASU
 JOB NAME SOLAR HOMESTEAD
 NOTES FLEX TRAILER CANOPY

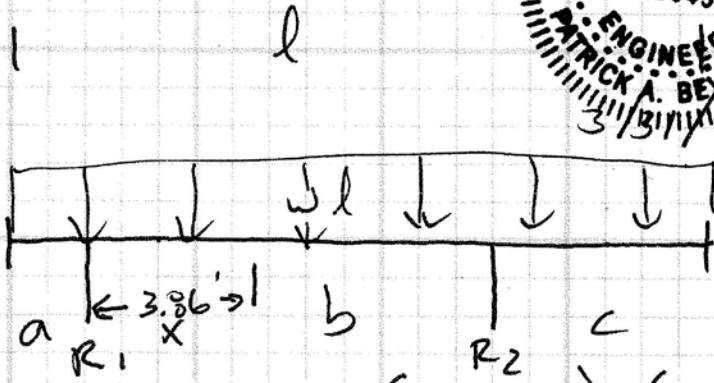
IONCON

IT'S ONLY NATURAL
 CONSULTATION + CONSERVATION + CONSTRUCTION

PATRICK A. BEVILLE, PE, LEED AP
 IONCON PLLC P-0620



1) CHECK MAIN CANOPY RAIL
 SEE FIGURE 22 ATTACHED



W = DISTRIBUTED
 LOAD OVER 19'
 2000 LB TOTAL (PER
 EMAIL)

$$2000 \text{ LB} / 19' = 105.26 \text{ \#/FT}$$

DIVIDED BY 2
 (EACH SIDE)

$$w = 52.63 \text{ \#/FT}$$

DEAD LOAD
 LIVE LOAD = 35 \#/SF
 x 11.575 / 2
 = 199.06

TOTAL = 251.69
 SAY 252 \#/FT

$$l = 18' - 11\frac{1}{2}'' \quad (18.96') \quad (227.5'')$$

$$a = 2' - 0\frac{1}{2}'' \quad (2.04') \quad (24.5'')$$

$$b = 10' - 9\frac{1}{2}'' \quad (10.79') \quad (129.5'')$$

$$c = 6' - 1\frac{1}{2}'' \quad (6.125') \quad (73.5'')$$

$$R_1 = \frac{w l (l - 2c)}{2b} = \frac{252 \text{ \#/FT} (18.96') (18.96' - 2(6.125'))}{2 (10.79')} = 1486 \text{ \#}$$

$$R_2 = \frac{w l (l - 2a)}{2b} = \frac{252 \text{ \#/FT} (18.96') (18.96' - 2(2.04'))}{2 (10.79')} = 3295 \text{ \#}$$

M_{MAX} OCCURS WHEN $x = \frac{R_1}{w} - a = \frac{1486}{252} - 2.04 = 3.86'$

$$= R_1 x - \frac{w(a+x)^2}{2} = 1486 (3.86) - \frac{252 (2.04 + 3.86)^2}{2}$$

$$= 1350 \text{ FT LBS}$$

CHECK NEGATIVE MOMENT

$$M_2 = -\frac{wc^2}{2} = \frac{252 (6.125)^2}{2} = 4921 \text{ FT LBS}$$

NEGATIVE
 MOMENT
 RULES

SHEET 2 OF 6 DRAWN BY PAS
 DATE _____ CONTACT _____
 CUSTOMER NAME ASU
 JOB NAME SOLAR HOMESTEAD
 NOTES FLEX TRAILER CANOPY

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CONSULTATION + CONSERVATION + CONSTRUCTION
 PATRICK A. DEVILLE, PE USED AP
 IONCON PLLC PRO820



CHECK FOR S TRY 46 KSI (HSS)
 $F_b = .6 F_y = .6 (36) = 21.6 \text{ KSI} = 27.6$

$$S = \frac{M}{F_b} = \frac{4921 \text{ FT LBS}}{21.6 \text{ KSI}} \times \frac{12 \text{ IN/FT}}{\frac{1000 \text{ LB}}{1 \text{ KP}}} = 2.74 \text{ IN}^3$$

HSS = 2.14

CHECK TUBING

FOR $3 \times 3 \times 3/16 = 1.73 \text{ IN}^3$ X N.G.

TRY $4 \times 4 \times 1/8$ HSS $S = 2.35$ ✓ > 2.14

$4 \times 4 \times 1/8$ WEIGHT = 6.46 #/FT
 ORIGINAL - $3 \times 3 \times 3/16 = 6.87$ #/FT *
 WEIGHT REDUCTION = 6%

MAKE NOTE:
 $5 \times 3 \times 1/8$ HSS CHANNEL
 $S = 2.58$ ✓
 MORE THAN SUFFICIENT

OPTION - $3 \times 3 \times 5/16$ HSS $S = 2.39$

NOTE: BECAUSE OF SHORT SPAN DEFLECTION DOES NOT RULE

2) CHECK COLUMN CAPACITY

EFFECTIVE WIND LOAD = (NC RES BUILDING CODE TABLE R 301.2(2))

EFFECTIVE WIND AREA = 100 + (216 SQFT) 130 MPH WIND ZONE
 ROOF 0 DEGREES LOAD = -33 #/FT

LOAD COMBINATIONS : ~~.6D + W~~, D + W, D + .75W + .75S

D + W = 2000 + 33(216) = 9128

D + .75W + .75S = 2000 + .75(33)(216) + .75(35)(216) = 13016 ✓

$13016 \text{ #} / 4 = 3254 \text{ #/POST}$ ✓ OK

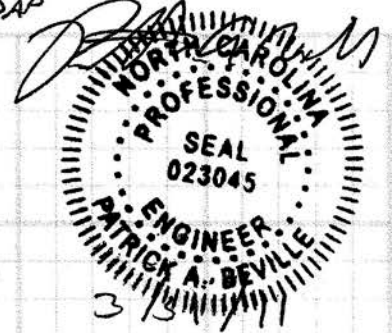
POST CAPACITY @ 13' ≈ 8 KIPS
 MORE THAN TWICE ALLOWABLE

SHEET 3 OF 6 DRAWN BY PAB
 DATE _____ CONTACT _____
 CUSTOMER NAME AGU
 JOB NAME SOLAR HOMESTEAD
 NOTES FLEX TRUSS CANOPY



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3) CHECK COLUMN BENDING

$$\text{EFFECTIVE AREA} = 19' \times 7'-4'' = 139 \text{ s.f.}$$

$$\text{ROOF} = 0^\circ \quad \text{ZONE 3} \quad 120 \text{ MPH}$$

TABLE R 301.2(2) NC BUILDING CODE

$$\text{COMPONENT LOAD} = -28.1 \times 139 = 3915 \#$$

$$\text{TELESCOPING LENGTH } 9'-8'' - 13'-0'' = 4'-4''$$

$$3915 / 4 \times 4'-4'' = 4.2 \text{ k.ft}$$

$$S = M / F_b = \frac{4.2 \text{ k.ft}}{21.6 \text{ ksi}} \times 12 \text{ in/ft} = 2.35 \text{ in}^3$$

$$2\frac{1}{2} \times 2\frac{1}{2} \times 5/16 \quad S = 1.50$$

NO GOOD - RECHECK
 EFFECTIVE WIND
 AREA.
 ALSO NOTE MULTIPLE ATTACHMENTS

BECAUSE OF LENGTH DEFLECTION DOES NOT RULE

ASSUME EFFECTIVE WIND AREA

$$a = 4 \text{ FT IN ALL CASES (FIGURE 301.2(7))}$$

$$\text{WORST CASE SCENARIO } \text{AWA} = 19' \times 4' = 76'$$

$$\times -28.1 \#/\text{ft} = 2135.6 \#$$

$$2135.6 \# / 4 \times 4'-4'' = 2.314 \text{ k.p ft}$$

$$S = M / F_b = \frac{2.314 \text{ k.ft}}{21.6 \text{ ksi}} \times 12 \text{ in/ft} = 1.28$$

$$2\frac{1}{2} \times 2\frac{1}{2} \times 5/16 \quad S = 1.50 \quad \checkmark$$

SHEET 4 OF 6 DRAWN BY PAS
 DATE _____ CONTACT _____
 CUSTOMER NAME ASU
 JOB NAME SOLAR HOMESTEAD
 NOTES FLEX TRAILER



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4) CHECK PRIMARY CHANNEL ON TRAILER = 4" x 5.4" #
 WORST CASE = END = 25.5 INCHES

ASSUME 2' SECTION FLOOR LOAD = 40 LL + 15 DL

WALL LOAD = 100# / LIN FT x 2' = 200 #

SS(2) + 200#

$$M = \frac{w \times l^2}{2} = \frac{110 \frac{\#}{FT} (25.5 IN)^2}{2} \times \frac{1 FT}{12 IN} + 200 (25.5) = 8080 \# IN$$

$$36 KSI \times .6 = 21.6$$

$$S = M / F_b = \frac{8080 \# IN}{21.6 KSI} = .374$$

$$S \ 4" \times 5.4" = 1.93 \quad \checkmark \quad OK$$

CHECK CENTER SECTION w/ ROOF LOAD

$$\frac{1}{2} \ 23.3 \ FT = 11.65 \ FT$$

ROOF LOAD = 11.65 FT x 35 LL + 15 DL

$$= 582.3 \# / FT$$

SPAN = 7.66 FT

$$M_{MAX} = \frac{w l^2}{8} \quad (\text{HIGHLY CONSERVATIVE})$$

$$= 582.3 = 4.2 \ K \cdot FT$$

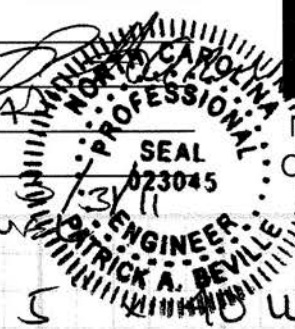
$$S = M / F_b = \frac{4.2 \ K \cdot FT \times \frac{12 IN}{1 FT}}{21.6 \ KSI} = 2.37 \quad S = 1.93 \ N.G.$$

NEXT: CHECK FOR NEGATIVE MOMENT AND
 ADD FLOOR LOAD

SHEET 5 OF 6 DRAWN BY PAB
 DATE _____ CONTACT _____
 CUSTOMER NAME ASU
 JOB NAME SOLAR HOMESTEAD
 NOTES FLEX TRAILER



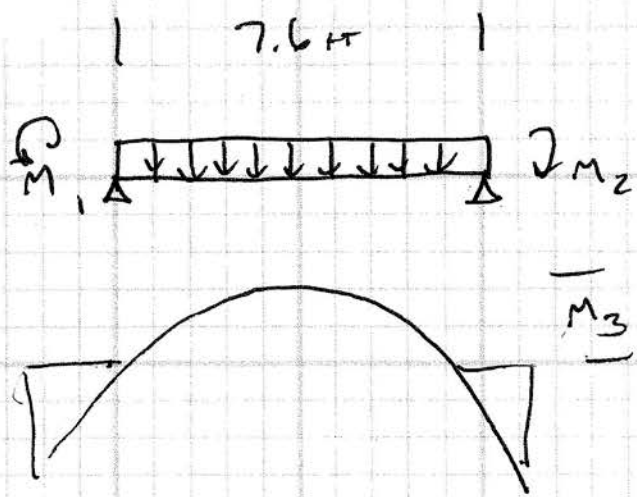
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CHECK PRIMARY CHAIN

ADD FLOOR LOAD = 5
 TOTAL LOAD = 605.2 #/FT

$$605.2 \text{ #/FT} \times 25.5 \text{ ft} + 15 \text{ DL} = 22.9 \text{ SAM } 23 \text{ #/s.f.}$$



$$M_1 = 605.2 \text{ #/FT} \times 25.5 \text{ inches}$$

$$= 1286 \text{ # FT}$$

$$= M_2$$

$$M_3 = \frac{wl^2}{8} - \frac{M_1 + M_2}{2}$$

$$M_3 = \frac{(605.2)(7.66)^2}{8} - \frac{1286 + 1286}{2} = 3152 \text{ # FT}$$

$$S = \frac{M}{F_b} = \frac{3.2 \text{ K FT}}{21.6} \times \frac{12 \text{ in}}{1 \text{ FT}} = 1.75 \text{ OK}$$

$$S \text{ of } C4 \times 5.4 \text{ } = 1.93 \text{ OK.}$$

SHEET 6 OF 6 DRAWN BY PAB
DATE _____ CONTACT _____
CUSTOMER NAME ASU
JOB NAME SOLAR HOMESTEAD
NOTES FLEX TRAILER



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5) CHECK SHEAR BOLTS

$$\text{TOTAL LOAD ON CANOPIES (SEE SHEET 2)} \\ = 13016 \# / 4 = 3254 \# / \text{POST}$$

EACH POST HAS 3 BOLTS IN DOUBLE SHEAR

$$\frac{1}{2}'' \text{ A307 BOLT 6MM 8 DOUBLE SHEAR} \\ \text{SHEAR VALUE} = \sim 4 \text{ KIPS} \times 3 = 12 \text{ KIPS} \\ \text{APPROXIMATE 4:1 SAFETY FACTOR } \checkmark$$

6) CHECK JACK CAPACITY = EACH ONE = 7500 #

$$\text{WORST CASE} = \text{MAIN HOUSE} = 12' \times 24'$$

$$\text{FLOOR LOAD} = 40 \text{ LL} + 15 \text{ DL} \\ \text{ROOF LOAD} = 35 \text{ LL} + 15 \text{ DL}$$

ASSUME 100 # / L.F. OF WALL

$$\text{TOTAL LOAD} = 75 \text{ LL} + 30 \text{ DL} + 100(12+12+24+24) \text{ DL} \\ = [1.6(75) + 1.2(30)] \times 12' \times 24' + 1.2(7200) \\ = 53568 \# \text{ TOTAL (WORST CASE)}$$

$$6 \text{ JACKS} = 45000 \#$$

$$\text{CHECK D.L ONLY} = 19000 \# \quad \checkmark \quad \text{OK.}$$



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LOT # 205 APRST
DRAWN BY
CHECKED BY: AL, D.M. DE
STATUS: AS-BUILT DRAWINGS

MARK, DATE, DESCRIPTION

SHEET TITLE:
GENERAL NOTES & SYMBOLS

SHEET NUMBER

S-001

GENERAL NOTES

- ALL STRUCTURAL WORK SHALL BE COORDINATED WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND SHALL CONFORM TO THE PROJECT SPECIFICATIONS, INCLUDING ALL APPLICABLE BUILDING CODES.
- CONTRACTOR SHALL PROVIDE TEMPORARY SHORING, BRACING, SHEETING AND MAKE SAFE ALL FLOORS, ROOFS, WALLS AND ADJACENT PROPERTY AS PROJECT CONDITIONS REQUIRE. SHORING AND SHEETING SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER HIRED BY THE CONTRACTOR, WHOM SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR THE OWNER'S REVIEW.
- DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION GIVEN IN STRUCTURAL DRAWINGS ARE BASED ON:
 - CONTAINED IN VARIOUS ORIGINAL DESIGN, CONSTRUCTION DOCUMENTS PROVIDED BY THE OWNER AND
 - OBSERVATIONS AND MEASUREMENTS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION PERTAINING TO EXISTING CONDITIONS BY ACTUAL MEASUREMENTS AND OBSERVATION AT THE SITE. ALL DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE SHOWN IN THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ENGINEER ON RECORD FOR HIS EVALUATION BEFORE THE AFFECTED CONSTRUCTION IS PUT IN PLACE.

FRAMING LUMBER

- ALL FRAMING SHALL CONFORM TO THE FOLLOWING GOVERNING STANDARDS (WHEN INFORMATION CONFLICTS, MORE CONSERVATIVE APPROACH SHALL GOVERN):
 - AMERICAN INSTITUTE OF TIMBER CONSTRUCTION, "TIMBER CONSTRUCTION MANUAL," LATEST EDITION.
 - NATIONAL FOREST PRODUCTS ASSOCIATION, "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION," LATEST EDITION.
 - NATIONAL FOREST ASSOCIATION "WOOD CONSTRUCTION MANUAL," LATEST EDITION.
 - NORTH CAROLINA STATE RESIDENTIAL CODE.
- SAWN LUMBER SHALL HAVE EACH PIECE GRADE STAMPED, SHALL BE SURFACE DRY (EXCEPT STUDS WHICH SHALL BE KILN DRIED), AND SHALL CONFORM TO THE FOLLOWING SPECIES AND GRADE OR BETTER:
 - RAFTERS AND JOISTS: SPRUCE-PINE-FIR #2
 - BEAMS, GIRDERS AND HEADERS: SPRUCE-PINE-FIR #2
 - POST AND TIMBER: SPRUCE-PINE-FIR #2
 - STRINGERS: SPRUCE-PINE-FIR #2
 - STUDS: SPRUCE-PINE-FIR #2
- TIMBER LUMBER SHALL CONFORM TO THE FOLLOWING SPECIES AND GRADE:
 - POST AND TIMBER: SPRUCE-PINE-FIR #2 TREATED
- PRESERVATIVE TREATED WOOD: PROVIDE TREATED LUMBER COMPLYING WITH THE AWFS-2 WHERE NOT ENCLOSED IN CONDITION SPACE.
- ALL WOOD FRAMING INCLUDING DETAILS FOR BRIDGING, BLOCKING, FIRE STOPPING, ETC. SHALL CONFORM TO THE LATEST EDITION OF THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" AND ITS SUPPLEMENTS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE NFPA MANUAL FOR HOUSE FRAMING.
- FASTENINGS SHALL BE IN ACCORDANCE WITH THE MOST RESTRICTIVE OF: THE INTERNATIONAL BUILDING CODE (LATEST EDITION), THE 1963 CABO FOR 1 AND 2 FAMILY DWELLINGS, THE MANUFACTURERS RECOMMENDED FASTENING, OR THE SOLAR DECATHLON BUILDING CODE AND RULES.
- ALL FLUSH FRAMED CONNECTIONS SHALL BE MADE WITH APPROVED GALVANIZED STEEL JOIST OR BEAM HANGERS, MINIMUM 1/8" GAUGE, INSTALLED ACCORDING TO MANUFACTURERS RECOMMENDATIONS. PROVIDE TOP MOUNTED JOIST HANGERS APPROPRIATE FOR THE SIZE OF SUPPORTED MEMBER (UNLESS OTHERWISE NOTED) BY SIMPSON OR EQUAL.
- WHERE SINGLE TOP PLATE IS USED ALL RAFTERS AND JOISTS SHALL ALIGN DIRECTLY WITH STUDS BELOW AND WALL CORNER JOINTS ARE TO BE FASTENED WITH SIMPSON CORNER TIE OR EQUAL.
- AT THE ENDS OF ALL BEAMS, HEADERS AND GIRDERS PROVIDE A BUILT UP OR SOLID POST WHOSE WIDTH IS AT LEAST EQUAL TO WIDTH OF THE MEMBER IT IS SUPPORTING AND WHOSE DEPTH IS 4" NOM. AT INTERIOR WALLS AND 6" NOM. AT EXTERIOR WALLS.
- USE DOUBLE TRIMMERS AND HEADERS AT ALL FLOOR OPENINGS WHERE BEAMS ARE NOT DESIGNATED.
- PROVIDE SOLID BLOCKING, CROSS BRACING, OR BRIDGING AT A MINIMUM OF 8' O.C.
- BUILT UP BEAMS LESS THAN 8" DEEP SHALL BE SPIKED OR SCREWED TOGETHER WITH 2-1/2" NAILS OR 3" SCREWS @ 16" O.C. BUILT UP BEAMS GREATER THAN 8" DEEP SHALL BE SPIKED OR SCREWED TOGETHER WITH 3-1/2" NAILS @ 16" O.C.
- NO NEW OR EXISTING JOISTS SHALL BE CUT OR NOTCHED WITHOUT APPROVAL.
- WHERE CANTILEVERED BEAMS ARE INDICATED THE FOUR CONNECTIONS SHALL BE CAPABLE OF RESISTING AN UPLIFT OF 1000 LBS. MINIMUM, UNLESS NOTED OTHERWISE.

PLYWOOD SHEATHING

- PROVIDE PLYWOOD SHEATHING COMPLYING WITH APA-GRADE STAMPED AND SHALL NOT EXCEED THE SPANS INTENDED FOR USE ON THE STAMP. ALL PLYWOOD SHALL BE MADE WITH EXTERIOR GLUE AND SHALL BE OF THE FOLLOWING THICKNESS AND ASSEMBLY:
 - FLOORS @ HOUSE AND FLEX OM: 3/4"-TWO LAYERS, CROSS LAID EXTERIOR WALLS @ HOUSE: 5/8" EXTERIOR WALLS @ FLEX: 3/4" WALLS @ ON CLOSETS AND FLEX KITCHEN: 3/4" EXTERIOR GRADE ROOFS: 3/4"
- ALL PLYWOOD SHALL BE SCREWED TO STEEL TRAILER JOISTS AND THE SECOND LAYER SHOULD BE GLUED AND SPOURED TO PREVIOUS.

ENGINEERED WOOD PRODUCTS

- WOOD TRUSSES: PROVIDE ENGINEERED WOOD TRUSSES, SIZE AND SERIES AS SHOWN, AS MANUFACTURED BY SELECT HOMES AND DESIGNED BY TRENCO, OR APPROVED EQUAL. INSTALL IN COMPLIANCE WITH THE MANUFACTURER'S STANDARD RECOMMENDATIONS AND DETAILS, INCLUDING CONSTRUCTION BRACING, MINIMUM BEARING LENGTHS, WEB STIFFENERS, SQUASH BLOCKS, BLOCKING, ETC.
- RIM BOARDS: PROVIDE CONTINUOUS 1 1/2" RIMBOARDS. RIMBOARDS SHALL BE OF MINIMUM SPRUCE-PINE-FIR #2. INSTALL IN COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AT THE PERIMETER OF WOOD TRUSSES.

STRUCTURAL STEEL

- ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE FOLLOWING GOVERNING STANDARDS:
 - AISC "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS," LATEST EDITION.
 - THE AMERICAN WELDING SOCIETY (AWSD) 11 "CODE FOR WELDING IN BUILDING CONSTRUCTION," LATEST EDITION.
- ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:
 - WIDE FLANGE BEAMS, COLUMNS AND STRUCTURAL TEES: ASTM A992
 - HOLLOW STRUCTURAL SECTIONS: ASTM A600, GRADE B
 - CHANNELS, ANGLES AND PLATES: ASTM A36 UNLESS OTHERWISE NOTED
- STEEL CONNECTIONS SHALL BE STANDARD AISC FRAMED BEAM CONNECTIONS:
 - FOR NON-COMPOSITE MEMBERS, PROVIDE CONNECTIONS BASED ON REACTION AS DETERMINED FROM AISC UNIFORM LOAD TABLE, UNLESS OTHERWISE NOTED ON PLANS.
 - REINFORCING IS TO BE PROVIDED AT CONNECTIONS WHERE CUTS REDUCE THE SHEAR OR MOMENT CAPACITY BELOW THAT IS REQUIRED TO SUSTAIN THE REACTION. FLANGES AND WEBS ARE TO BE REINFORCED WHERE THE LOCAL CAPACITY TO SUSTAIN THE CONNECTION IS INADEQUATE.
 - CONNECTIONS SHALL BE DESIGNED FOR SHEAR AND ECCENTRICITY, CONSIDERING THAT THE CONNECTION IS AN EXTENSION OF THE BEAM AND GIRDERS.
- ALL BEAMS EXCEPT CANTILEVER BEAMS SHALL BE FABRICATED WITH NATURAL CHAMFER UP. CANTILEVER BEAMS SHALL BE FABRICATED SO THAT NATURAL CHAMFER RISES AT CANTILEVER END.
- WELDING SHALL BE PERFORMED BY CERTIFIED LICENSED WELDERS AND ARE AINS QUALIFIED. WELDING ELECTRODES SHALL BE ASTM 233, CLASS EXXXV (USE LOW HYDROGEN ELECTRODES FOR A572, GRADE 50 STEEL).
- SHOP PRIME ALL STEEL MEMBERS WITH TMEC6 #10-99 PER MANUFACTURERS SPECIFICATIONS.
- SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. NO FABRICATION OF STEEL SHALL COMMENCE WITHOUT APPROVED SHOP DRAWINGS.

STEEL ERECTION

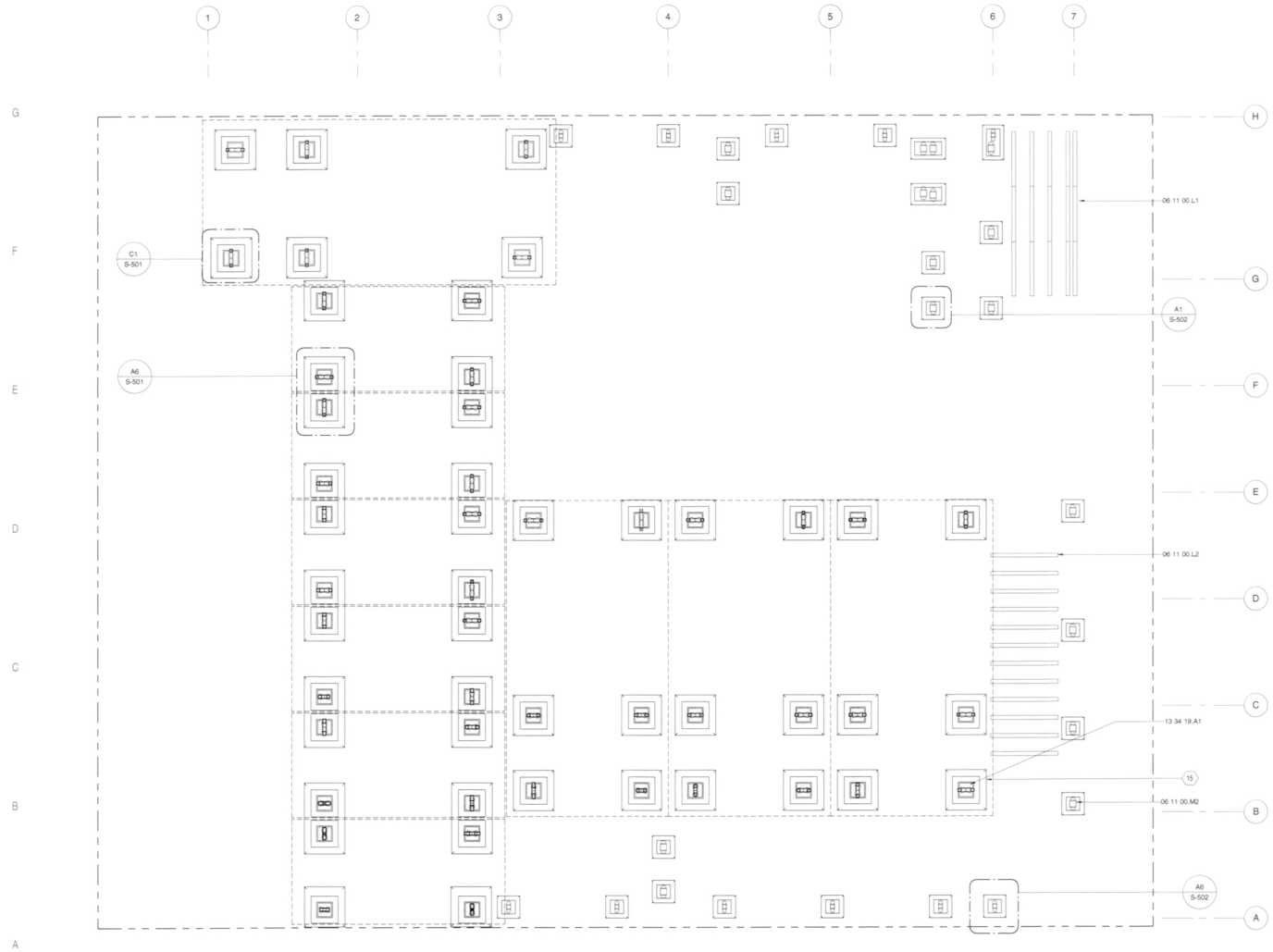
- VERIFY FIELD MEASUREMENTS PRIOR TO START OF ERECTION. CHECK THE ALIGNMENT AND ELEVATION OF ALL COLLARS SUPPORTS AND LOCATION OF ALL ATTACHMENTS WITH TRANSIT AND LEVEL INSTRUMENTS BEFORE STARTING ERECTION. NOTIFY ARCHITECT OF ANY ERRORS. OBTAIN ARCHITECT'S APPROVAL OF METHODS PROPOSED FOR CORRECTING ERRORS PRIOR TO PROCEEDING WITH CORRECTIONS AND ERECTION.
- COLUMNS SHALL BE SUPPORTED AND ALIGNED ON STEEL WEDGES OR SHIMS. AFTER THE MEMBERS HAVE BEEN PLUMBED AND PROPERLY POSITIONED BY INSTRUMENT THE ENTIRE BEARING SURFACE SHALL BE FULLY FILLET WELDED.
- STRUCTURAL STEEL SHALL BE ERECTED TRUE AND LEVEL, AND TEMPORARY BRACING SHALL BE INTRODUCED WHEREVER NECESSARY TO PROVIDE FOR ALL LOADS TO WHICH THE STRUCTURE MAY BE SUBJECTED, INCLUDING EQUIPMENT AND THE OPERATION THEREOF. SUCH BRACING SHALL BE LEFT IN PLACE AS LONG AS MAY BE REQUIRED FOR SAFETY. NO WELDING SHALL BE DONE UNTIL STRUCTURAL STEEL HAS BEEN PROPERLY ALIGNED.
- COMPLY WITH AISC CODE AND SPECIFICATIONS AND MAINTAIN WORK IN A SAFE AND STABLE CONDITION DURING ERECTION. PROVIDE TEMPORARY BRACING AND SHORING AS REQUIRED. REMOVE WHEN FINAL CONNECTIONS ARE PLACED.
- SPICE MEMBERS ONLY WHERE SHOWN ON FINAL SHOP DRAWINGS
- CLEAN ALL FIELD WELDS, BOLTED CONNECTIONS AND BRAWDED AREAS AND APPLY A RUST INHIBITIVE COATING.

FOUNDATION SYSTEM

- BEARING PAD FOUNDATIONS SHALL BEAR ON UNDISTURBED SOIL HAVING MAXIMUM LOAD OF 1500 PSF AND BE IN ACCORDANCE WITH SOLAR DECATHLON BUILDING CODES AND RULES.
- FOUNDATION PADS SHALL BE ADJUSTED TO PROVIDE A LEVEL BEARING SURFACE FOR SCISSOR JACKS.
- SCISSOR JACKS SHALL BE OF SUFFICIENT QUALITY AND POSITIONED TO CARRY NO MORE THAN 7500 LBS EACH.

INSPECTIONS

- INSPECTIONS SHALL BE PERFORMED BY A QUALIFIED LICENSE STRUCTURAL ENGINEER FOR THE FOLLOWING ITEMS:
 - WELDING
 - HIGH STRENGTH BOLTING
 - JACK FOUNDATIONS AND BEARING PAD ASSEMBLIES
 - QUALITY CONTROL OF MANUFACTURED STRUCTURAL ASSEMBLIES
 - STABILITY OF BUILDING CONSTRUCTION
 - TRAILER AXLE LOAD RATINGS
- INSPECTING PARTY SHALL FILE ALL APPROPRIATE FORMS WITH THE BUILDING DEPARTMENT IF REQUIRED.



GENERAL SHEET NOTES

1. ENGINEERS STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
2. ALL FOUNDATION BEARING PADS NOT TO EXCEED THE MAXIMUM SOL BEARING CAPACITY OF 1500 PSF.
3. FOUNDATION BEARING PADS NOT TO EXCEED 1500 PSF



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REFERENCE KEYNOTES

- | | |
|-------------|----------------------------|
| 06 11 00.L1 | 4X4 |
| 06 11 00.L2 | 4X4 TREATED |
| 06 11 00.M2 | 6X6 TREATED POST |
| 13 34 19.A1 | MANUFACTURED STEEL TRAILER |



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SHEET KEYNOTES

- | | |
|----|-------------------------|
| 15 | FOUNDATION BEARING PADS |
|----|-------------------------|

LOT # 255 (APPT)
 DRAWN BY: JA
 CHECKED BY: KL, DAM, CE
 STATUS: AS-BUILT DRAWINGS
 MARK - DATE - DESCRIPTION

A1 FOUNDATION PLAN
 1/4" = 1'-0"



01 02 03 04 05 06 07 08 09 10

SHEET TITLE
 FOUNDATION PLAN

SHEET NUMBER

S-101



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LOT # 355/APPST
 DRAWN BY: JA
 CHECKED BY: KL, DM, CS
 STATUS: AS-BUILT DRAWINGS
 MARK - DATE: DESCRIPTION

SHEET TITLE:
 STEEL FLOOR FRAMING PLAN

SHEET NUMBER:

S-102

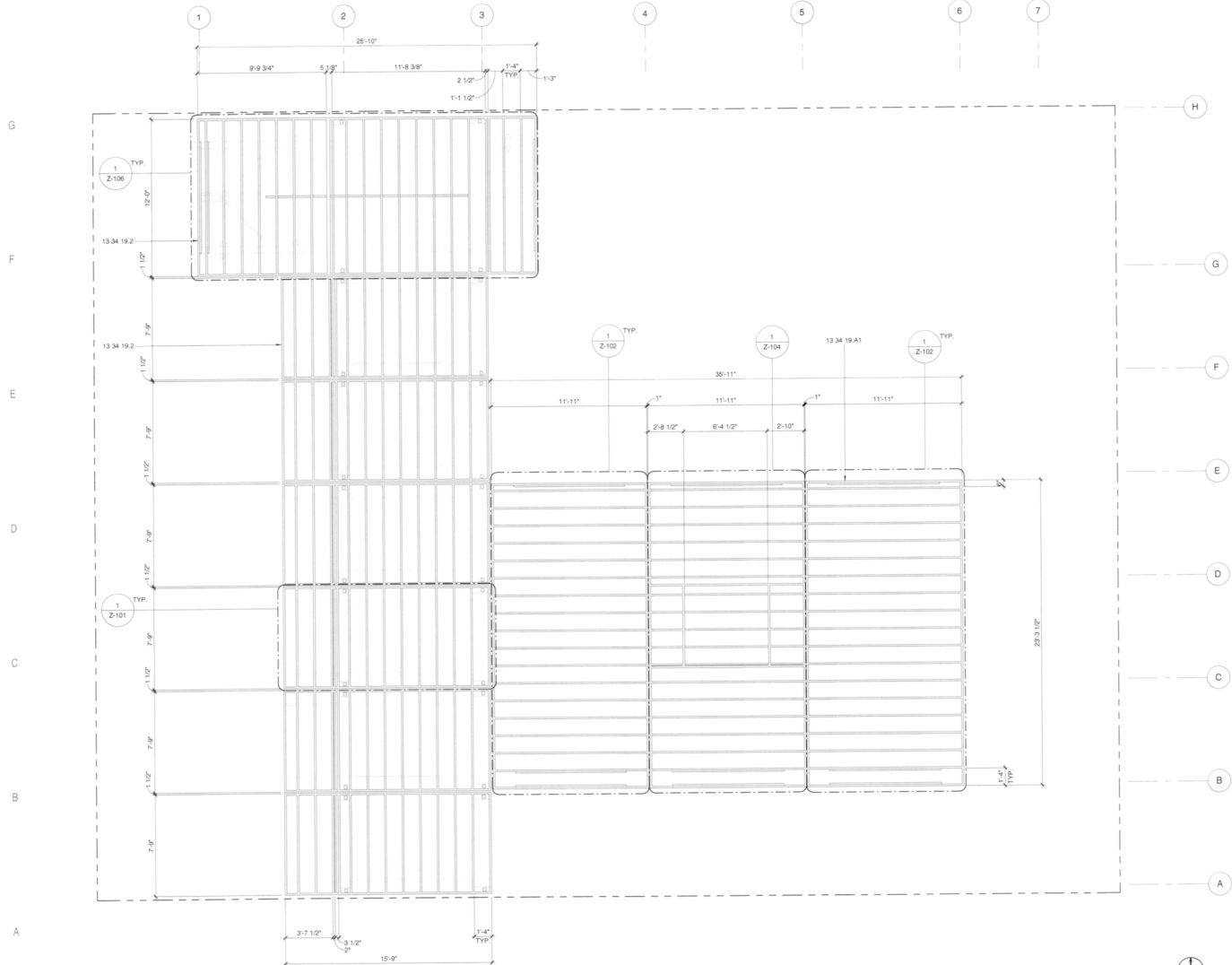
GENERAL SHEET NOTES

- ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
- ALL STEEL TRAILERS TO MEET REGULATIONS FOR HIGHWAY TRAVEL AND SHALL BE REGISTERED WITH THE N.C. DOT.
- WHEELS AND AXLES TO BE REMOVED FROM AXLES ONCE TRAILERS ARE LEVEL IF REQUIRED.
- REFER TO SHOP DRAWINGS (2-###) FOR EXACT DIMENSIONS AND DETAILS OF STEEL TRAILERS.

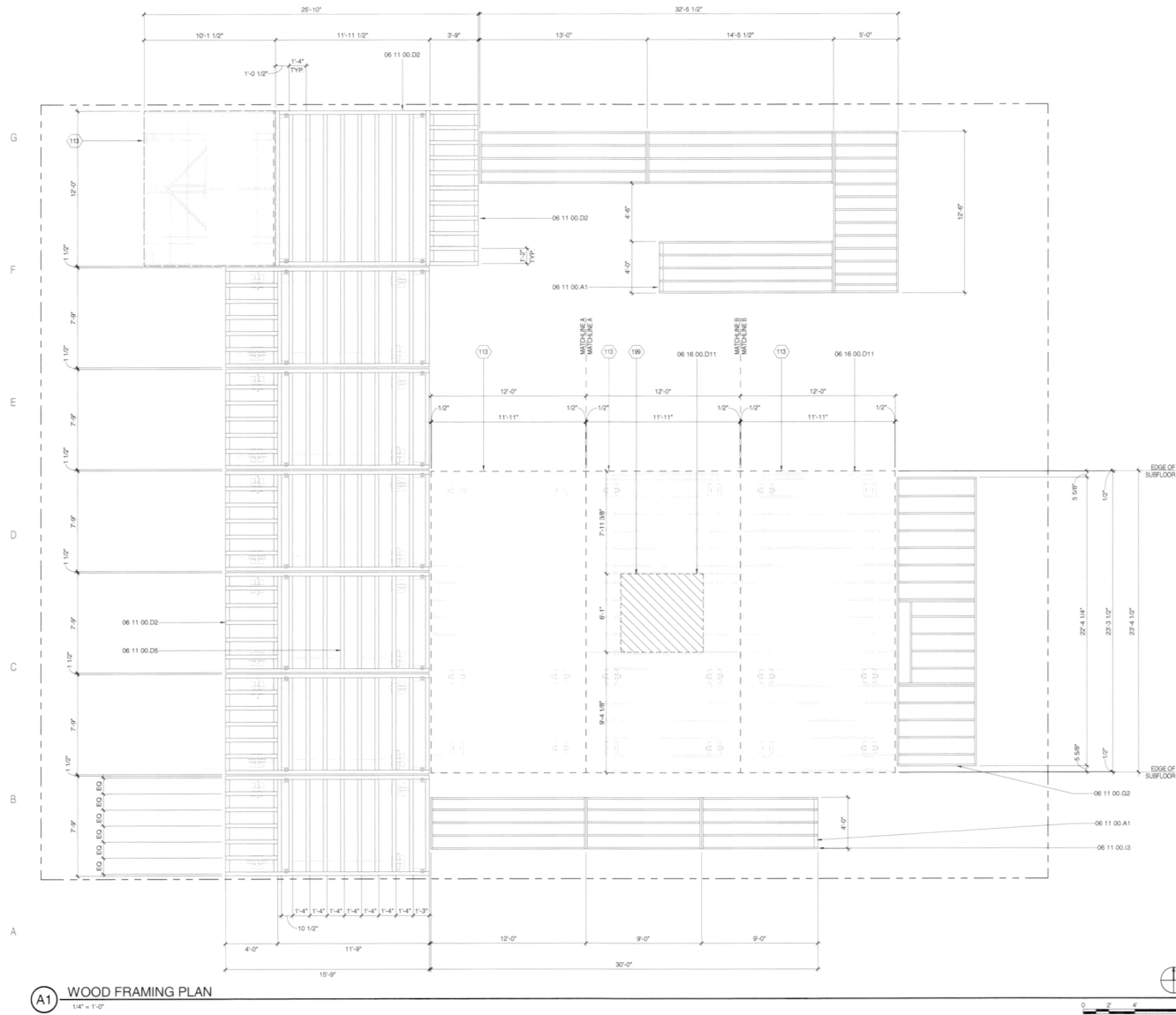
REFERENCE KEYNOTES

13.34.19.2
 13.34.19.A1 MANUFACTURED STEEL TRAILER

SHEET KEYNOTES



A1 STEEL FLOOR FRAMING PLAN
 1/4" = 1'-0"



GENERAL SHEET NOTES

- ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY
- DRAWING SHOWS WOODEN FLOOR DECKING FRAMING FOR INTERIOR AND EXTERIOR SPACES OF THE SOLAR HOMESTEAD.
- ALL FRAMING TO BE PRESSURE TREATED AND INSTALLED WITH SELF TAPPING SCREWS.

WOOD FRAMING LEGEND

- 2 LAYERS CROSS LAID 3/4" SUBFLOOR
- 2 LAYERS CROSS LAID 3/4" SUBFLOOR ATTACHED TO TRAILER DROP SECTION
- TREATED 2x4
- TREATED 2x10

REFERENCE KEYNOTES

- | | |
|--------------|------------------------|
| 06 11 00 A1 | BLOCKING |
| 06 11 00 D2 | TREATED 2x4 |
| 06 11 00 D3 | 2x4 FRAMING @ 16" O.C. |
| 06 11 00 G2 | 2x6 FRAMING @ 16" O.C. |
| 06 11 00 J3 | 2x12 JOISTS @ 12" O.C. |
| 06 16 00 D11 | 3/4" PLYWOOD |

SHEET KEYNOTES

- | | |
|-----|---|
| 113 | TWO LAYERS OF 3/4" PLYWOOD CROSS LAID |
| 199 | TWO LAYERS OF 3/4" SUBFLOOR CROSS LAID ATTACHED TO TRAILER DROP SECTION |



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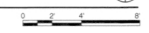
LOT # 255 LAPPST
DRAWN BY: JA
CHECKED BY: AL, DAM, CE
STATUS: AS-BUILT DRAWINGS
MARK - DATE - DESCRIPTION

SHEET TITLE:
WOOD FRAMING PLAN

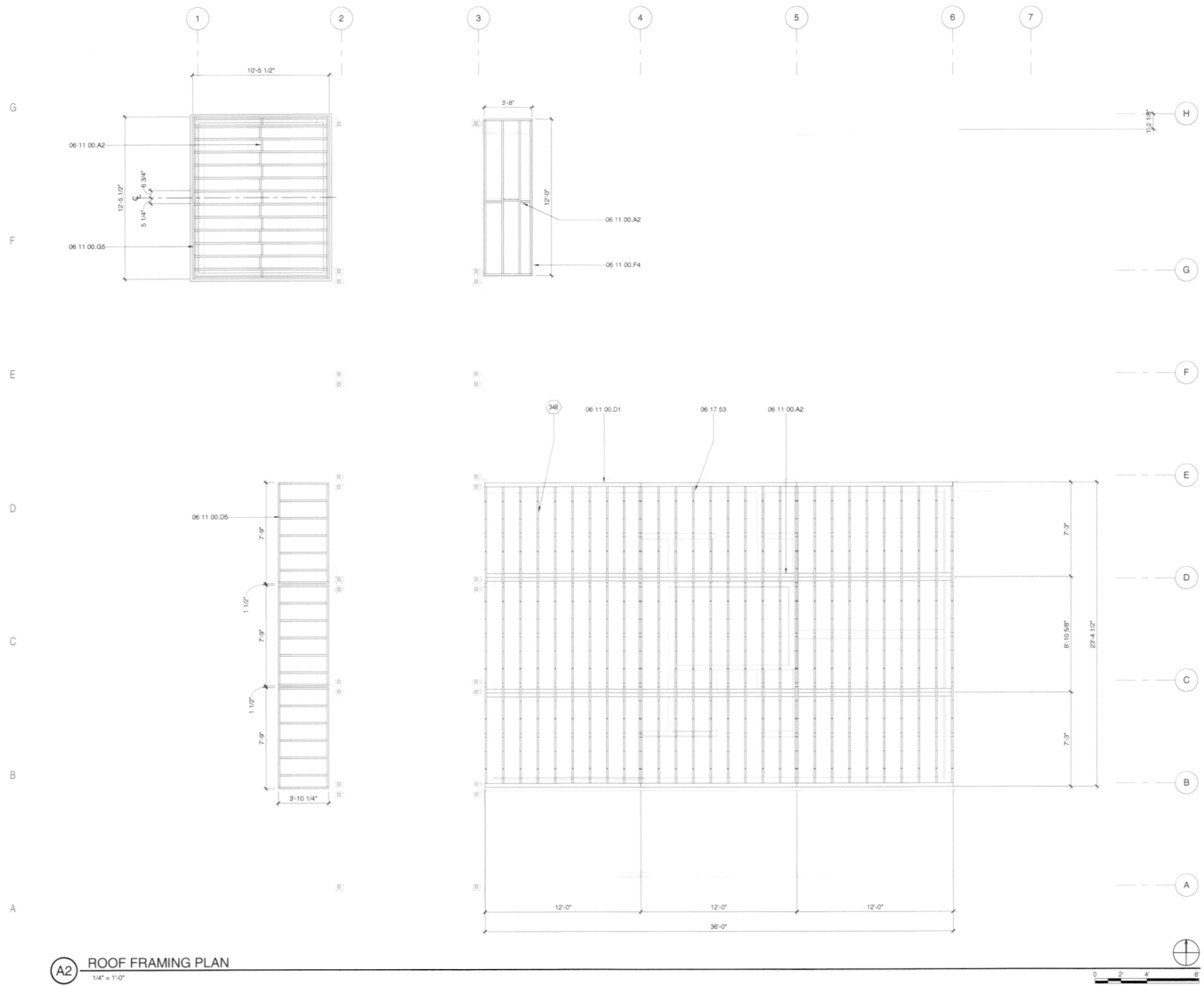
SHEET NUMBER:

S-103

A1 WOOD FRAMING PLAN
1/4" = 1'-0"



01 02 03 04 05 06 07 08 09 10



A2 ROOF FRAMING PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

1. ENGINEERS STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
2. ALL ROOFS TO HAVE 3/4" PLYWOOD SHEATHING.

REFERENCE KEYNOTES

- 06 11 00.A1 BLOCKING
- 06 11 00.A2 BRIDGING
- 06 11 00.D1 2X4
- 06 11 00.D5 2X4 FRAMING @ 12" O.C.
- 06 11 00.F4 2X6 FRAMING @ 12" O.C.
- 06 11 00.G5 2X6 JOISTS @ 12" O.C.
- 06 17 53 SHOP-FABRICATED WOOD TRUSSES

SHEET KEYNOTES

- 348 TRUSSES 12" O.C.



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CLIENT:



LOT # 255 | AP/ST
DRAWN BY: JA
CHECKED BY: AL, DAM, CE
STATUS: AS-BUILT DRAWINGS
MARK - DATE - DESCRIPTION

SHEET TITLE:
ROOF FRAMING PLAN

SHEET NUMBER:

S-104



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SOLAR DECATHLON
U.S. DEPARTMENT OF ENERGY (ENERGY DECATHLON 2011)
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LIT # 351 APPST
DRAWN BY: JA
CHECKED BY: AL, DAM, CE
STATUS: AS-BUILT DRAWINGS
MARK - DATE: DESCRIPTION

SHEET TITLE:
OM CANOPY FRAMING PLANS

SHEET NUMBER:

S-105

GENERAL SHEET NOTES

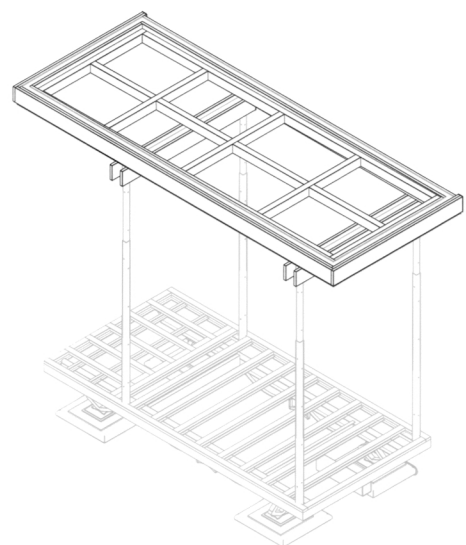
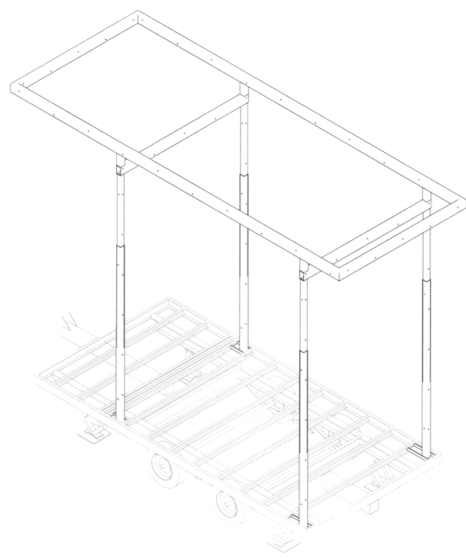
- ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
- FOR EXACT CANOPY DIMENSIONS AND DETAIL REFER TO SHOP DRAWINGS.

REFERENCE KEYNOTES

- | | |
|---------------|--------------|
| 05 12 73 L250 | TSSX300 1875 |
| 06 11 00 H1 | 2X10 |
| 06 11 00 L1 | 2X10 |
| 06 11 00 L5 | 4X8 BEAM |

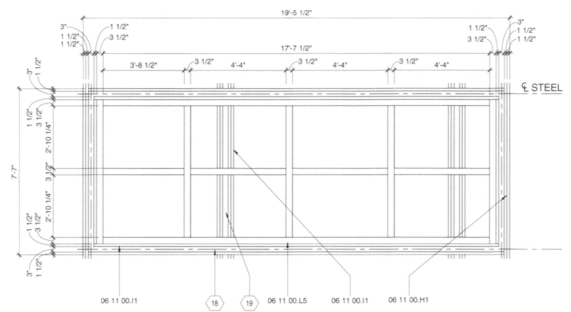
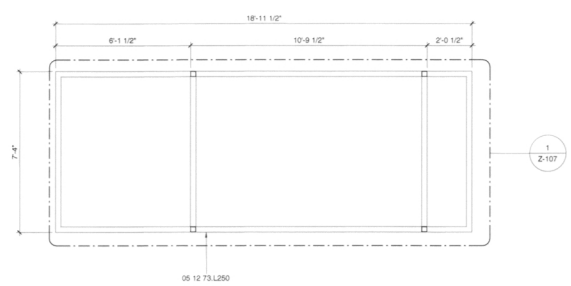
SHEET KEYNOTES

- | | |
|----|---------------------------|
| 18 | STEEL CANOPY FRAME |
| 19 | STEEL CANOPY GIRDER BELOW |



D1 OM CANOPY STEEL FRAMING, TYP
NTS

D6 OM CANOPY WOOD FRAMING, TYP
NTS



A1 OM CANOPY STEEL FRAMING PLAN, TYP
3/8" = 1'-0"

A5 CANOPY WOOD FRAMING PLAN, TYP
3/8" = 1'-0"

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GENERAL SHEET NOTES

1. ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
2. FOR EXACT CANOPY DIMENSIONS AND DETAIL REFER TO SHOP DRAWINGS.

REFERENCE KEYNOTES

- | | |
|---------------|-------------|
| 05 12 73 L250 | TS6X30X16TS |
| 06 11 00 H1 | 2X10 |
| 06 11 00 L1 | 2X12 |
| 06 11 00 L5 | 4X6 BEAM |

SHEET KEYNOTES

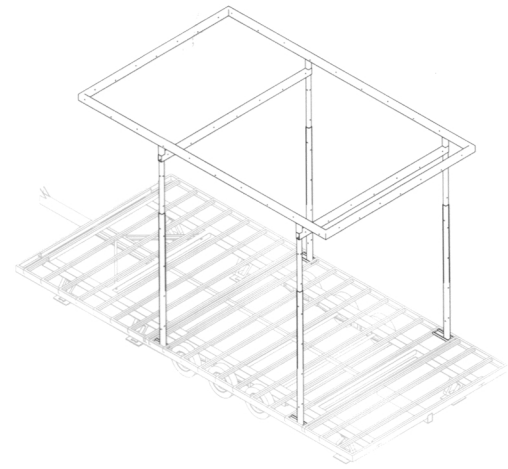
- | | |
|----|---------------------------|
| 18 | STEEL CANOPY FRAME |
| 19 | STEEL CANOPY GIRDER BELOW |

LOT # 251 APPST
 DRAWN BY: JA
 CHECKED BY: KL, D.M., CE
 STATUS: AS-BUILT DRAWINGS
 MARK - DATE - DESCRIPTION

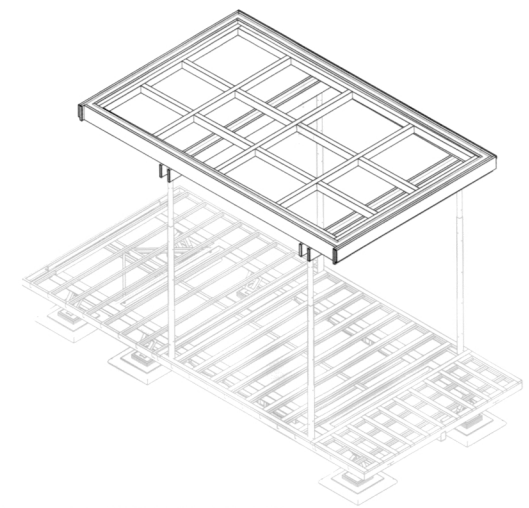
SHEET TITLE:
 FLEX OM CANOPY FRAMING PLANS

SHEET NUMBER:

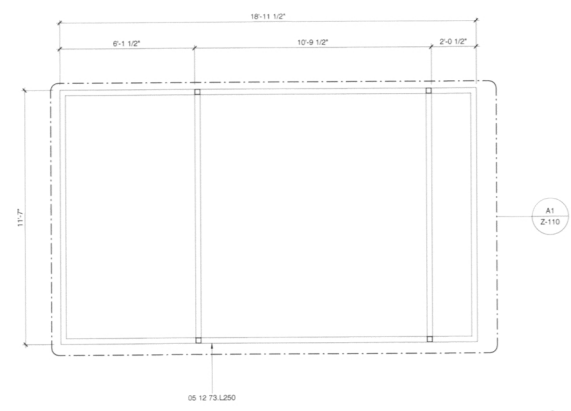
S-106



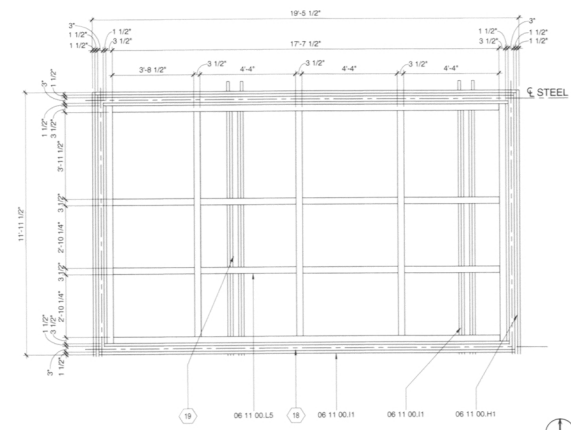
E1 FLEX OM CANOPY STEEL FRAMING
 NTS



E6 FLEX OM CANOPY WOOD FRAMING
 NTS



A1 FLEX OM CANOPY STEEL FRAMING PLAN
 3/8\"/>



A6 FLEX OM CANOPY WOOD FRAMING PLAN
 3/8\"/>

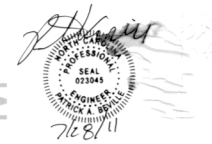
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LOT #: 003 | ARCHT:
DRAWN BY: JA
CHECKED BY: KL, D.M., CE
STATUS: AS-BUILT DRAWINGS
MARK, DATE, DESCRIPTION

SHEET TITLE:
LATERAL BRACING PLAN

SHEET NUMBER:

S-107

GENERAL SHEET NOTES

- ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
- TYPICAL LATERAL BRACED CONDITION. SEE DETAILS ON S-503 + S-504
- ALL TELESCOPING COLUMNS TO BE SECURED WITH A MINIMUM OF 2 GRADE 5 THRU BOLTS

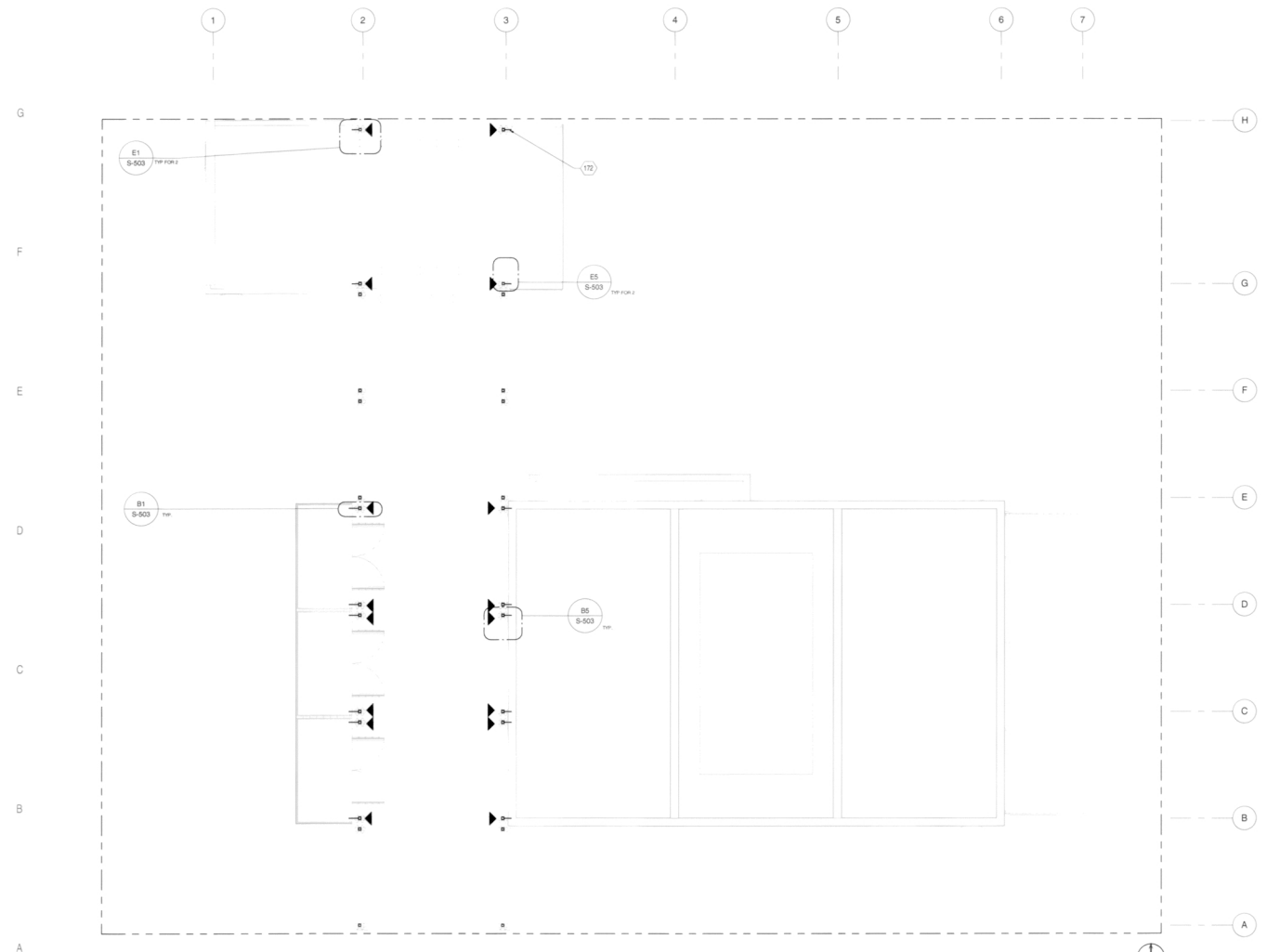
LATERAL BRACING LEGEND

- ▶ LOCATION OF LATERAL STABILITY ATTACHMENT POINTS

REFERENCE KEYNOTES

SHEET KEYNOTES

- 172 LATERAL BRACING TABS TO BE MANUFACTURED FROM 3/16" STEEL.



A2 LATERAL BRACING PLAN
1/4" = 1'-0"



01 02 03 04 05 06 07 08 09 10



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LOT #: 305 / APPST
 DRAWN BY: JR
 CHECKED BY: AL, DAL, CE
 STATUS: AS-BUILT DRAWINGS
 MARK, DATE, DESCRIPTION

SHEET TITLE:
 TRAILER BEARING DETAILS

SHEET NUMBER

S-501

GENERAL SHEET NOTES

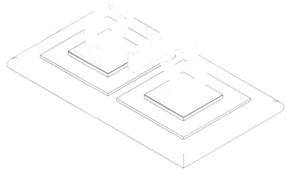
- ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
- REFER TO STRUCTURAL DRAWINGS AND CALCULATIONS FOR BEARING WEIGHTS.
- FOUNDATION SYSTEM SIZED FOR 1000-1500 LBS/SF MAXIMUM.

REFERENCE KEYNOTES

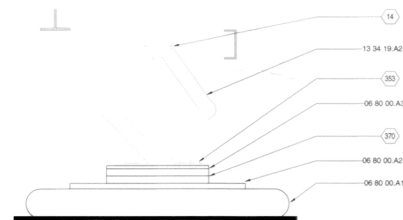
- | | |
|-------------|---------------------------|
| 06 80 00 A1 | SURPLAP SACKS |
| 06 80 00 A2 | 24GX4.75 FOUNDATION PADS |
| 06 80 00 A3 | 14X4 RECYCLED RUBBER PADS |
| 13 34 19 A2 | SCISSOR JACK |

SHEET KEYNOTES

- | | |
|-----|---|
| 14 | STEEL JACKS WELDED TO TRAILER FRAMES DURING TRAILER MANUFACTURING |
| 353 | 1X12X8" STEEL PLATE WELDED TO JACKS DURING TRAILER MANUFACTURING |
| 370 | RUBBER PADS STACKED TO NECESSARY HEIGHT TO LEVEL TRAILERS |



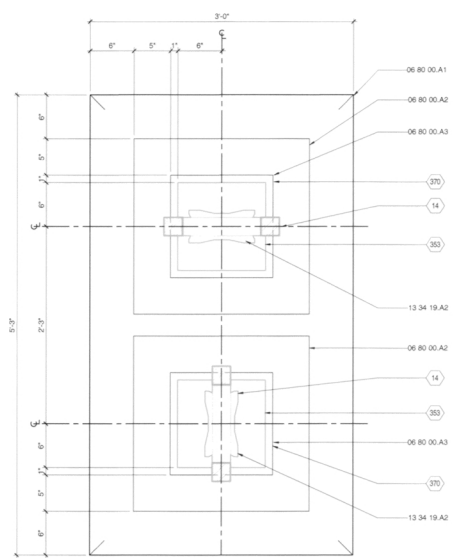
F1 DOUBLE JACK BEARING PAD ISOMETRIC
 NTS



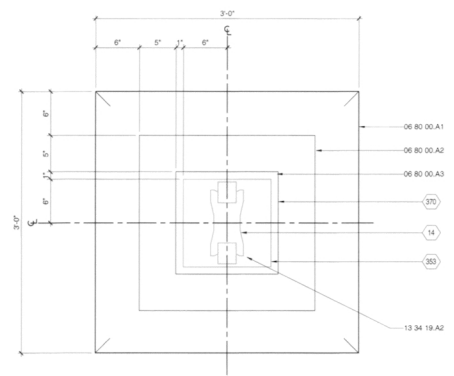
C6 TRAILER JACK BEARING PAD ELEVATION
 1 1/2" = 1'-0"



E1 SINGLE JACK BEARING PAD ISOMETRIC
 NTS



A6 DOUBLE JACK BEARING PAD DETAIL
 1 1/2" = 1'-0"



C1 SINGLE JACK BEARING PAD DETAIL
 1 1/2" = 1'-0"

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LOT #: 202 / AP#ST
DRAWN BY: JA
CHECKED BY: KL, DLM, CE
STATUS: AS-BUILT DRAWINGS
MARK - DATE - DESCRIPTION

GENERAL SHEET NOTES

- ENGINEERS STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY.
- GROUND PENETRATIONS NOT TO EXCEED 18 INCHES IN VERTICAL DEPTH.

REFERENCE KEYNOTES

- | | |
|--------------|------------------|
| 06 05 23.N9 | PC44 |
| 06 05 23.N17 | PC06 |
| 06 11 00.B13 | 1X12 |
| 06 11 00.B | TREATED 2X12 |
| 06 11 00.L1 | 4X4 |
| 06 11 00.L2 | 4X4 TREATED |
| 06 11 00.M2 | 6X6 TREATED POST |
| 06 16 00.D14 | 1" PLYWOOD |
| 06 80 00.A1 | BULKHEAD SIKES |

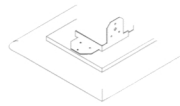
SHEET KEYNOTES

- | | |
|-----|--------------------|
| 371 | DECK FRAMING ABOVE |
| 372 | SITE WALL ABOVE |

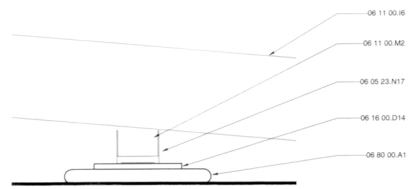
SHEET TITLE:
SITE BEARING DETAILS

SHEET NUMBER:

S-502



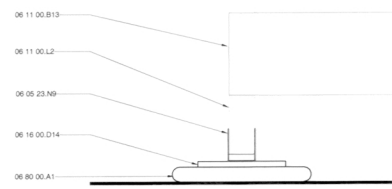
F1 RAMP AND DECK BEARING PAD ISOMETRIC
1" = 20'-0"



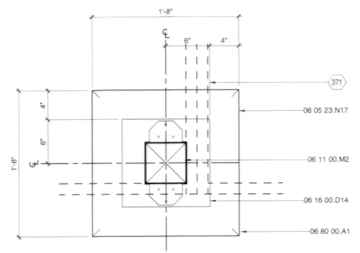
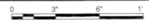
D1 RAMP AND DECK BEARING PAD ELEVATION
1 1/2" = 1'-0"



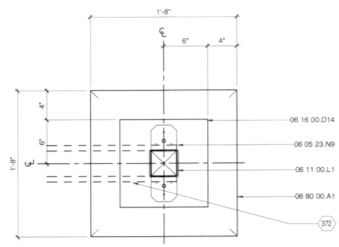
F6 SITE WALL BEARING PAD ISOMETRIC
NTS



D6 SITE WALL BEARING PAD ELEVATION
1 1/2" = 1'-0"



A1 RAMP AND DECK BEARING PAD DETAIL
1 1/2" = 1'-0"



A6 SITE WALL BEARING PAD DETAIL
1 1/2" = 1'-0"



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GENERAL SHEET NOTES

1. ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY



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LOT # 205 / APPIST
 DRAWN BY: JA
 CHECKED BY: KL, DLM, CE
 STATUS: AS-BUILT DRAWINGS
 MARK - DATE - DESCRIPTION

REFERENCE KEYNOTES

- 05 05 23.A1 1/2" A307 BOLT
- 06 05 23.B1 3/8" LAG SCREW
- 06 11 00 WOOD FRAMING
- 06 11 00.D3 2X4 FRAMING
- 06 16.00.D1 3/4" PLYWOOD

SHEET KEYNOTES

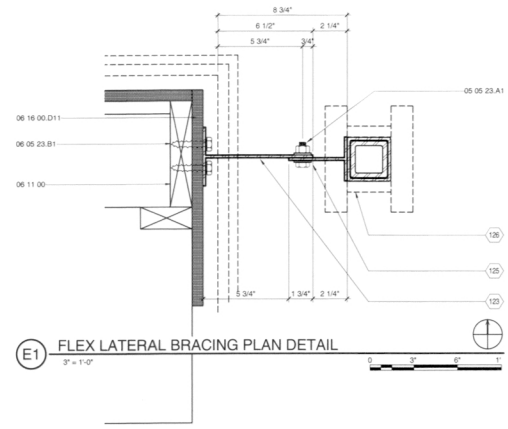
- 122 SLOTTED CONNECTION ON L ANGLE
- 123 SHOP FABRICATED LATERAL BRACING
- 124 SLOTTED CONNECTION ON WALL MOUNTED T
- 125 SLOTTED CONNECTION ON MARRIAGE BANDS
- 126 VENEERS AND FINISH SURFACES SHOWN DOTTED

SHEET TITLE:
 LATERAL BRACING PLAN DETAILS

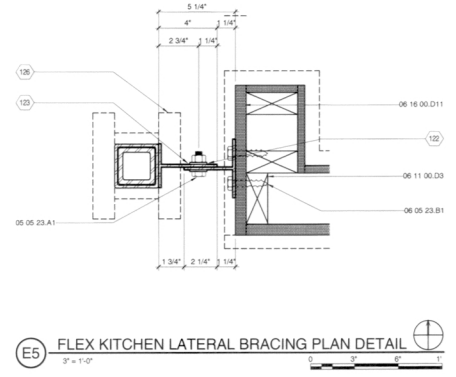
SHEET NUMBER:

S-503

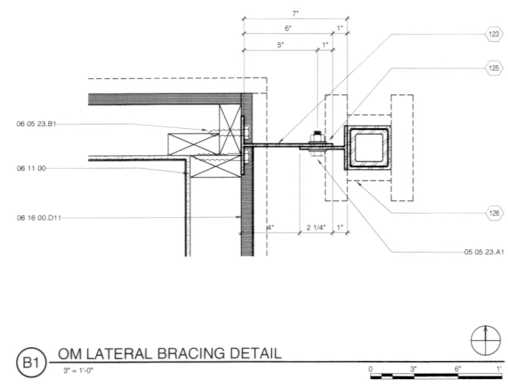
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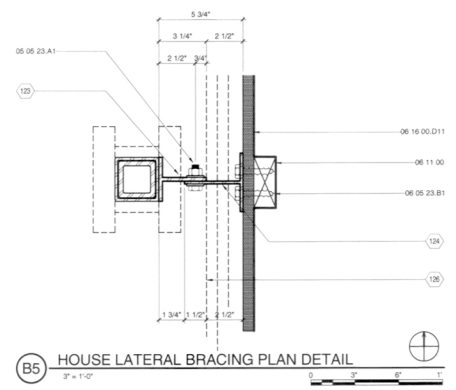
E1 FLEX LATERAL BRACING PLAN DETAIL
 3" = 1'-0"



E5 FLEX KITCHEN LATERAL BRACING PLAN DETAIL
 3" = 1'-0"



B1 OM LATERAL BRACING DETAIL
 3" = 1'-0"



B5 HOUSE LATERAL BRACING PLAN DETAIL
 3" = 1'-0"

01 02 03 04

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GENERAL SHEET NOTES

- ENGINEER'S STAMP APPLIES TO STRUCTURAL DRAWINGS ONLY



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SOLAR DECATHLON
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LOT # 005 / APPST
DRAWN BY: JA
CHECKED BY: KL, DUM, CE
STATUS: AS-BUILT DRAWINGS
MARK - DATE - DESCRIPTION

REFERENCE KEYNOTES

- | | |
|--------------|-----------------------------|
| 05 05 23.A1 | 1/2" ANCH BOLT |
| 06 05 23.B1 | 3/8" LAG SCREW |
| 06 11 00 | WOOD FRAMING |
| 06 16 00.D8 | 3/8" PLYWOOD |
| 06 16 00.D11 | 3/4" PLYWOOD |
| 06 16 00.D12 | 3/4" EXTERIOR GRADE PLYWOOD |

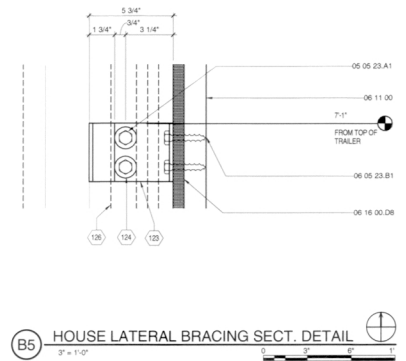
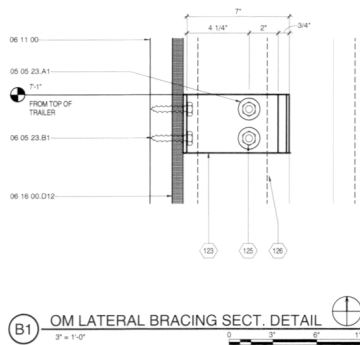
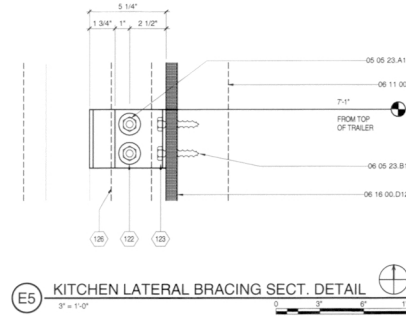
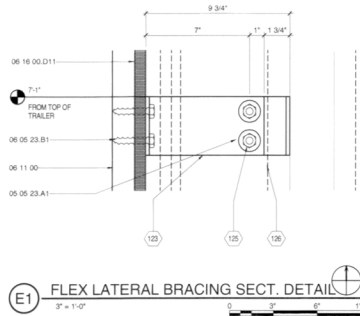
SHEET KEYNOTES

- | | |
|-----|--|
| 122 | SLOTTED CONNECTION ON L ANGLE |
| 123 | SHOP FABRICATED LATERAL BRACING |
| 124 | SLOTTED CONNECTION ON WALL MOUNTED T |
| 125 | SLOTTED CONNECTION ON MARRIAGE BANDS |
| 126 | VENEERS AND FINISH SURFACES SHOWN DOTTED |

SHEET TITLE:
LATERAL BRACING SIDE DETAILS

SHEET NUMBER:

S-504



April 29, 2011

Mr. Travis McKenzie
Solar Decathlon Team Project Manager
The Solar Homestead
Appalachian State University
1100 E. King Street
Boone, North Carolina 28607

Re: ASU Solar Homestead Structural Calculations Review for Wind Impacts

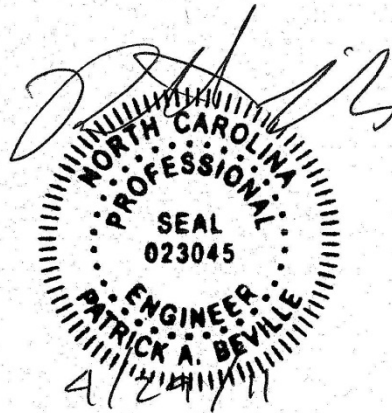
I have reviewed the attached subject calculations. They are in accordance with our numerous discussions throughout the design process. They also indicate adequate structural resistance to the possible wind impacts on the structure. As such, I have stamped each sheet of the calculations and am returning them to you for your use.

Please let me know if you need any other information.

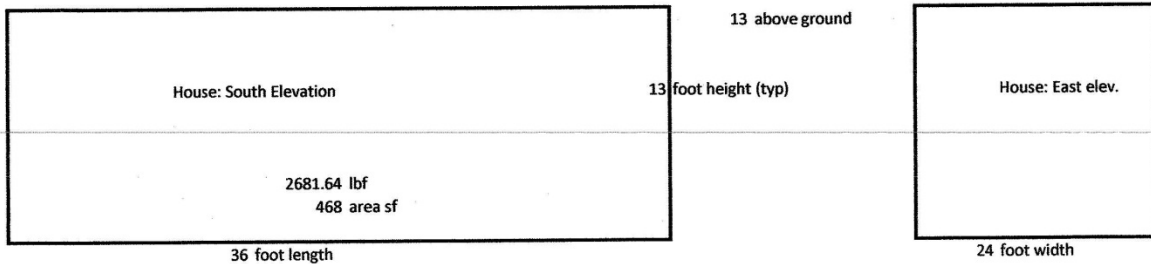
Sincerely,



Patrick A. Beville, PE, LEED AP
(PE License NC 023045)
Principal, IONCON NC License # P-0820



HOUSE: HORIZONTAL WIND LOADS



Maximum Horizontal Wind Pressure= 5.73 psf @ 60mph (extrapolated from ASCE Chapter 6, figure 6.2)

Total Horizontal Wind Force= 2,682 lbf
 Safety Factor of 2= 5,363 lbf

Sliding: Total weight of House= 39,000 lb
 Therefore, normal force Fn= 39,000 lb

The minimum static coefficient of friction required to prevent sliding= $\frac{2,682}{39,000}$ or 0.06876

The static coefficient of friction is expected to be 0.8 between the jack pads and geotextile wrapped sand bags, therefore, no sliding is expected.

Overturning (excluding uplift forces):

| | | | | |
|--------------------------------|--------|---------|-------|------------|
| Calculated Overturning Moments | Moment | Element | Force | Moment Arm |
| | 34,861 | House | 5,363 | 6.5 |

Overturning Moment 34,861 foot pounds
 Safety Factor of 2= 69,723 foot pounds

| | | |
|------------------|--------|------------------------------------|
| Resisting Moment | Force | Moment Arm (20 feet between jacks) |
| | 39,000 | 10 |

Resisting Moment= 390,000 foot pounds

The resisting moment is nearly 6 times the wind generated moment, therefore, no overturning is expected

HOUSE: VERTICAL WIND LOADS

Uplift: Total uplift is calculated including the combined roof areas, deck area, and canopy area.

Maximum Vertical Wind Pressure= -6.87 psf @ 60mph (extrapolated from ASCE Chapter 6, figure 6.2)

| | | |
|---------|------|----------|
| Element | Area | Force |
| Roof | 864 | -5935.68 |

Total Vertical Wind Force= -5,936 lbf
 Safety Factor of 2= -11,871 lbf
 Since the weight of the House is 39,000 lbs, there is no expected uplift.

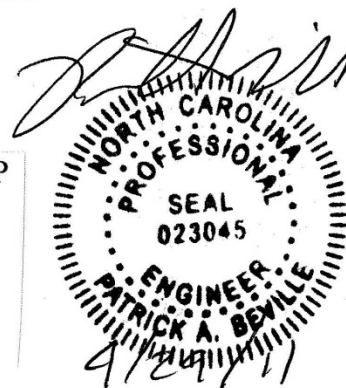
Overturning (including uplift forces):

Overturning resisting force= 39,000 plus -5,936 which equals: 27,129 lbs

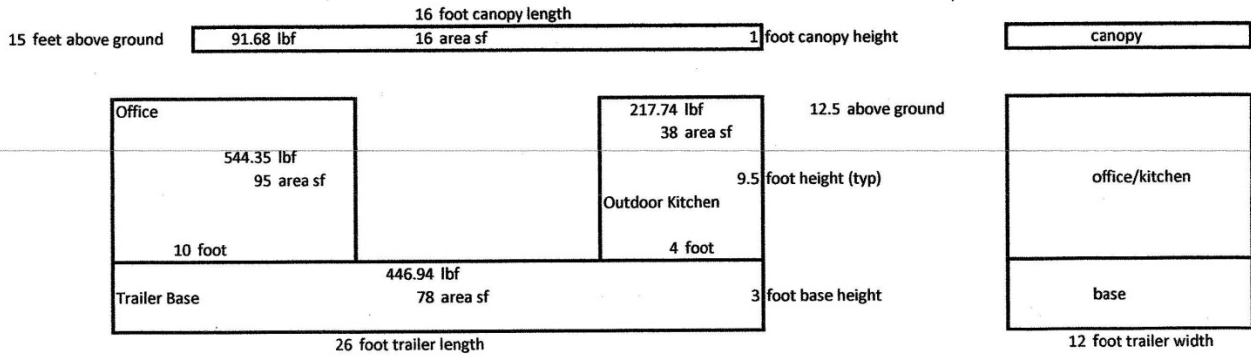
Resisting Moment= 271,286 foot pounds

The resisting moment is still over three times the wind generated moment, therefore, no overturning is expected

Patrick A. Beville, PE, LEED AP
 (PE License NC 023045)
 IONCON NC License # P-0820
 164 South Depot Street
 Boone, North Carolina 28607
 (828) 264-8500



FLEX OM TRAILER: HORIZONTAL WIND LOADS



Maximum Horizontal Wind Pressure= 5.73 psf @ 60mph (extrapolated from ASCE Chapter 6, figure 6.2)

Total Horizontal Wind Force= 1,301 lbf
 Safety Factor of 2= 2,601 lbf

Sliding: Total weight of Flex OM= 15,000 lb
 Therefore, normal force Fn= 15,000 lb

The minimum static coefficient of friction required to prevent sliding= $\frac{2,601}{15,000}$ or 0.1734

The static coefficient of friction is expected to be 0.8 between the jack pads and geotextile wrapped sand bags, therefore, no sliding is expected.

Overturning (excluding uplift forces):

| Calculated Overturning Moments | Moment | Element | Force | Moment Arm |
|--------------------------------|--------|---------|--------|------------|
| | 1,329 | canopy | 91.68 | 14.5 |
| | 4,219 | office | 544.35 | 7.75 |
| | 1,687 | kitchen | 217.74 | 7.75 |
| | 670 | base | 446.94 | 1.5 |

Sum of Moments 7,906 foot pounds
 Safety Factor of 2= 15,812 foot pounds

Resisting Moment Force Moment Arm (8 feet between jacks)
 15,000 4

Resisting Moment= 60,000 foot pounds

The resisting moment is nearly 4 times the wind generated moment, therefore, no overturning is expected

FLEX OM TRAILER: VERTICAL WIND LOADS

Uplift: Total uplift is calculated including the combined roof areas, deck area, and canopy area.

Maximum Vertical Wind Pressure= -6.87 psf @ 60mph (extrapolated from ASCE Chapter 6, figure 6.2)

| Element | Area | Force |
|---------|------|----------|
| Canopy | 192 | -1319.04 |
| Trailer | 300 | -2061 |

Total Vertical Wind Force= -3,380 lbf
 Safety Factor of 2= -6,760 lbf

Since the weight of the Flex OM is 15,000 lbs, there is no expected uplift.

Overturning (including uplift forces):

Overturning resisting force= 15,000 minus 6,760 which equals: 8,240 lbs

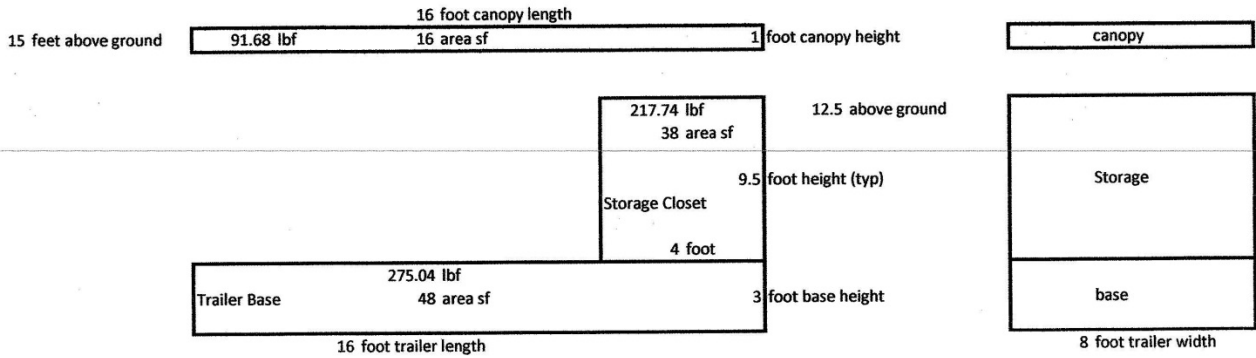
Resisting Moment= 32,960 foot pounds

The resisting moment is still two times the wind generated moment, therefore, no overturning is expected

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OM TRAILER: HORIZONTAL WIND LOADS



Maximum Horizontal Wind Pressure= 5.73 psf @ 60mph (extrapolated from ASCE Chapter 6, figure 6.2)

Total Horizontal Wind Force= 584 lbf
 Safety Factor of 2= 1,169 lbf

Sliding: Total weight of OM= 6,000 lb
 Therefore, normal force Fn= 6,000 lb

The minimum static coefficient of friction required to prevent sliding= $\frac{1,169}{6,000}$ or 0.19482

The static coefficient of friction is expected to be 0.8 between the jack pads and geotextile wrapped sand bags, therefore, no sliding is expected.

Overturning (excluding uplift forces):

| Calculated Overturning Moments | Moment | Element | Force | Moment Arm |
|--------------------------------|--------|---------|--------|------------|
| | 1,329 | canopy | 91.68 | 14.5 |
| | 1,687 | storage | 217.74 | 7.75 |
| | 413 | base | 275.04 | 1.5 |

Sum of Moments 3,429 foot pounds
 Safety Factor of 2= 6,859 foot pounds

Resisting Moment Force Moment Arm (8 feet between jacks)
 6,000 4

Resisting Moment= 24,000 foot pounds

The resisting moment is over 3 times the wind generated moment, therefore, no overturning is expected

OM TRAILER: VERTICAL WIND LOADS

Uplift: Total uplift is calculated including the combined roof areas, deck area, and canopy area.

Maximum Vertical Wind Pressure= -6.87 psf @ 60mph (extrapolated from ASCE Chapter 6, figure 6.2)

| Element | Area | Force |
|---------|------|---------|
| Canopy | 128 | -879.36 |
| Trailer | 128 | -879.36 |

Total Vertical Wind Force= -1,759 lbf
 Safety Factor of 2= -3,517 lbf Since the weight of the Flex OM is 5,000 lbs, there is no expected uplift.

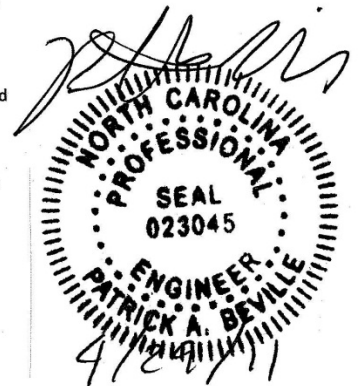
Overturning (including uplift forces):

Overturning resisting force= 6,000 plus -3,517 which equals: 2,483 lbs

Resisting Moment= 9,930 foot pounds

The resisting moment is still larger than the wind generated moment, therefore, no overturning is expected

Patrick A. Beville, PE, LEED AP
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Trenco

818 Soundside Rd
Edenton, NC 27932

Re: SOLAR_HOMESTEAD
24' ROOF TRUSS

The truss drawing(s) referenced below have been prepared by Truss Engineering Co. under my direct supervision based on the parameters provided by Deltec Homes, Inc..

Pages or sheets covered by this seal: E5988789 thru E5988789

My license renewal date for the state of North Carolina is December 31, 2011.

North Carolina COA: C-0844

Important Notice: If visually graded lumber is used for the trusses covered by these designs, see "SPIB Important Notice, Dated July 28, 2010" (reprinted at www.mii.com) before use. Trenco does not warrant third-party lumber design values.



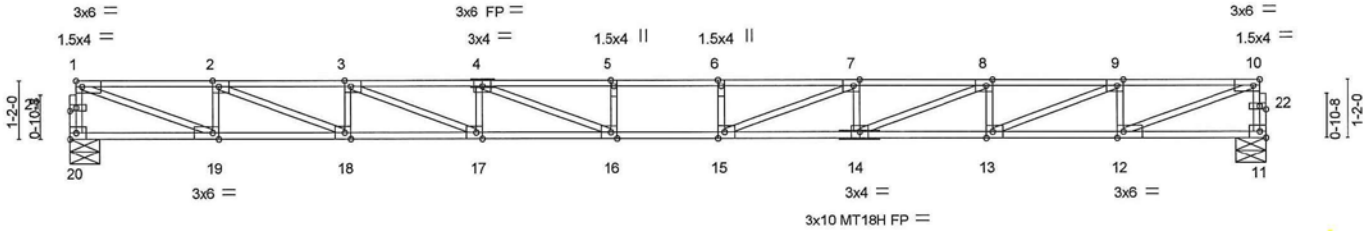
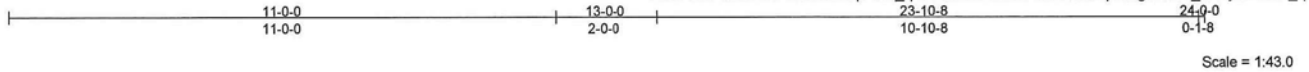
March 30, 2011

Gilbert, Eric

The seal on these drawings indicate acceptance of professional engineering responsibility solely for the truss components shown. The suitability and use of this component for any particular building is the responsibility of the building designer, per ANSI/TPI-1 Chapter 2. Engineering services provided by Truss Engineering Company.

| | | | | | | |
|--|--------|------------|-----|-----|----------------|--------------------------|
| Job | Truss | Truss Type | Qty | Ply | 24' ROOF TRUSS | E5988789 |
| SOLAR_HOMESTEAD | 24ROOF | FLAT | 1 | 1 | 24' ROOF TRUSS | |
| Deltec Building Systems, Asheville, NC | | | | | | Job Reference (optional) |

7.250 s Mar 23 2011 MiTek Industries, Inc. Tue Mar 29 14:58:01 2011 Page 1
 ID:ICLSMHsLa7MeZ1d4Sxd69pzVW2_q-ICLSMHsLa7MeZ1d4Sxd69pHHGCBx6v_1ANj06szVW2_q



TRUSS TO BE USED AS ROOF TRUSS ONLY.
 PROVIDE ADEQUATE DRAINAGE TO PREVENT WATER PONDING.

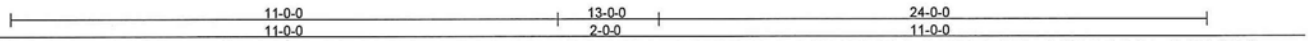


Plate Offsets (X, Y): [2:0-1-8,Edge], [3:0-1-8,Edge], [7:0-1-8,Edge], [8:0-1-8,Edge], [9:0-1-8,Edge], [10:0-1-8,Edge], [12:0-1-8,Edge], [13:0-1-8,Edge], [15:0-1-8,Edge], [16:0-1-8,Edge], [17:0-1-8,Edge], [18:0-1-8,Edge], [19:0-1-8,Edge], [21:0-1-8,0-12], [22:0-1-8,0-12]

| LOADING (psf) | SPACING | CSI | DEFL | PLATES | GRIP |
|---------------|-------------------------------|----------|--|----------------|---------------|
| TCLL 30.0 | 1-0-0 Plates Increase 1.15 | TC 0.18 | in (loc) l/defl L/d Vert(LL) -0.32 15-16 >895 240 | MT20 | 244/190 |
| TCDL 10.0 | Lumber Increase 1.15 | BC 0.34 | Vert(TL) -0.64 15-16 >448 180 | MT18H | 244/190 |
| BCLL 0.0 | Rep Stress Incr YES | WB 0.15 | Horz(TL) 0.07 11 n/a n/a | | |
| BCDL 10.0 | Code IRC2009/TPI2007 | (Matrix) | | | |
| | | | | Weight: 119 lb | FT = 0%F, 0%E |

LUMBER
 TOP CHORD 4 X 2 SYP SS
 BOT CHORD 4 X 2 SYP SS
 WEBS 4 X 2 SYP SS

BRACING
 TOP CHORD Sheathed or 6-0-0 oc purlins, except end verticals.
 BOT CHORD Rigid ceiling directly applied or 10-0-0 oc bracing.

REACTIONS (lb/size) 20=591/0-7-4 (min. 0-1-8), 11=591/0-7-4 (min. 0-1-8)
 Max Horz 20=-17(LC 3)
 Max Uplift 20=-36(LC 5), 11=-36(LC 5)

FORCES (lb) - Maximum Compression/Maximum Tension
 TOP CHORD 20-21=-580/43, 1-21=-579/43, 1-2=-1428/93, 2-3=-2403/153, 3-4=-3053/192, 4-5=-3362/212, 5-6=-3362/212, 6-7=-3362/212, 7-8=-3056/193, 8-9=-2402/153, 9-10=-1428/93, 11-22=-580/43, 10-22=-579/43
 BOT CHORD 19-20=-14/35, 18-19=-98/1428, 17-18=-157/2403, 16-17=-197/3067, 15-16=-213/3362, 14-15=-193/3056, 13-14=-153/2402, 12-13=-92/1428, 11-12=-6/35
 WEBS 5-16=-92/21, 6-15=-94/22, 2-19=-504/52, 3-18=-358/39, 4-17=-228/33, 7-14=-229/33, 8-13=-357/39, 9-12=-504/52, 10-12=-92/1492, 7-15=-22/328, 9-13=-65/1047, 8-14=-44/703, 4-16=-20/318, 3-17=-43/698, 2-18=-66/1048, 1-19=-92/1492

- NOTES**
- 1) Wind: ASCE 7-05; 90mph; TCDL=6.0psf; BCDL=6.0psf; h=30ft; Cat. II; Exp C; enclosed; MWFRS (low-rise); cantilever left and right exposed; end vertical left and right exposed; Lumber DOL=1.33 plate grip DOL=1.33
 - 2) Provide adequate drainage to prevent water ponding.
 - 3) All plates are MT20 plates unless otherwise indicated.
 - 4) All plates are 3x4 MT20 unless otherwise indicated.
 - 5) This truss has been designed for a 10.0 psf bottom chord live load nonconcurrent with any other live loads.
 - 6) Provide mechanical connection (by others) of truss to bearing plate capable of withstanding 36 lb uplift at joint 20 and 36 lb uplift at joint 11.
 - 7) This truss is designed in accordance with the 2009 International Residential Code sections R502.11.1 and R802.10.2 and referenced standard ANSI/TPI 1.

LOAD CASE(S) Standard



March 30, 2011

WARNING - Verify design parameters and READ NOTES ON THIS AND INCLUDED MITEK REFERENCE PAGE MI-7473 rev. 10-'08 BEFORE USE.
 Design valid for use only with MiTek connectors. This design is based only upon parameters shown, and is for an individual building component. Applicability of design parameters and proper incorporation of component is responsibility of building designer - not truss designer. Bracing shown is for lateral support of individual web members only. Additional temporary bracing to insure stability during construction is the responsibility of the erector. Additional permanent bracing of the overall structure is the responsibility of the building designer. For general guidance regarding fabrication, quality control, storage, delivery, erection and bracing, consult **ANSI/TPI1 Quality Criteria, DSB-89 and BCSI Building Component Safety Information** available from Truss Plate Institute, 281 N. Lee Street, Suite 312, Alexandria, VA 22314.

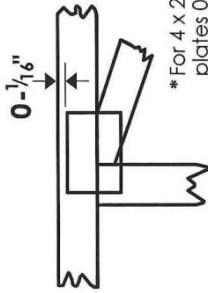


818 Soundside Road
 Edenton, NC 27932

Symbols

PLATE LOCATION AND ORIENTATION

Center plate on joint unless x, y offsets are indicated. Dimensions are in ft-in-sixteenths. Apply plates to both sides of truss and fully embed teeth.



* For 4 x 2 orientation, locate plates $0-\frac{1}{16}$ " from outside edge of truss.



* This symbol indicates the required direction of slots in connector plates.

* Plate location details available in **MiTek 20/20 software** or upon request.

PLATE SIZE

4 X 4

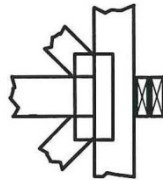
The first dimension is the plate width measured perpendicular to slots. Second dimension is the length parallel to slots.

LATERAL BRACING LOCATION



Indicated by symbol shown and/or by text in the bracing section of the output. Use T, I or Eliminator bracing if indicated.

BEARING



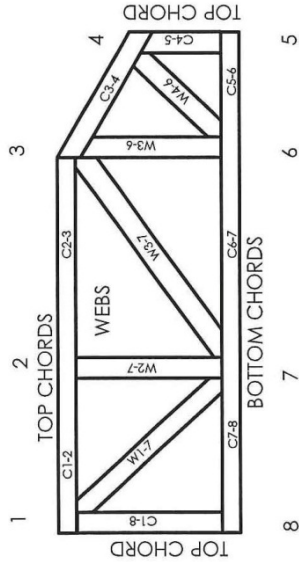
Indicates location where bearings (supports) occur. Icons vary but reaction section indicates joint number where bearings occur.

Industry Standards:

ANSI/TP1: National Design Specification for Metal Plate Connected Wood Truss Construction.
 DSB-89: Design Standard for Bracing.
 BCSI: Building Component Safety Information, Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

Numbering System

6-4-8 dimensions shown in ft-in-sixteenths (Drawings not to scale)



JOINTS ARE GENERALLY NUMBERED/LETTERED CLOCKWISE AROUND THE TRUSS STARTING AT THE JOINT FARTHEST TO THE LEFT.

CHORDS AND WEBS ARE IDENTIFIED BY END JOINT NUMBERS/LETTERS.

PRODUCT CODE APPROVALS

ICC-ES Reports:

ESR-1311, ESR-1352, ER-5243, 9604B
 9730, 95-43, 96-31, 9667A
 NER-487, NER-561
 951110, 84-32, 96-67, ER-3907, 9432A

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MiTek Engineering Reference Sheet: MIL-7473 rev. 10-'08

General Safety Notes

Failure to Follow Could Cause Property Damage or Personal Injury

- Additional stability bracing for truss system, e.g. diagonal or X-bracing, is always required. See BCSI.
- Truss bracing must be designed by an engineer. For wide truss spacing, individual lateral braces themselves may require bracing, or alternative T, I, or Eliminator bracing should be considered.
- Never exceed the design loading shown and never stack materials on inadequately braced trusses.
- Provide copies of this truss design to the building designer, erection supervisor, property owner and all other interested parties.
- Cut members to bear tightly against each other.
- Place plates on each face of truss at each joint and embed fully. Knots and warps at joint locations are regulated by ANSI/TP1.
- Design assumes trusses will be suitably protected from the environment in accord with ANSI/TP1.
- Unless otherwise noted, moisture content of lumber shall not exceed 19% at time of fabrication.
- Use expressly noted, this design is not applicable for use with fire retardant, preservative treated, or green lumber.
- Camber is a non-structural consideration and is the responsibility of truss fabricator. General practice is to camber for dead load deflection.
- Plate type, size, orientation and location dimensions indicated are minimum plating requirements.
- Lumber used shall be of the species and size, and in all respects, equal to or better than that specified.
- Top chords must be sheathed or purlins provided at spacing indicated on design.
- Bottom chords require lateral bracing at 10 ft. spacing, or less, if no ceiling is installed, unless otherwise noted.
- Connections not shown are the responsibility of others.
- Do not cut or alter truss member or plate without prior approval of an engineer.
- Install and load vertically unless indicated otherwise.
- Use of green or treated lumber may pose unacceptable environmental, health or performance risks. Consult with project engineer before use.
- Review all portions of this design (front, back, words and pictures) before use. Reviewing pictures alone is not sufficient.
- Design assumes manufacture in accordance with ANSI/TP1 Quality Criteria.



B MANUFACTURER'S SPECIFICATIONS

DIVISION 01 **GENERAL
REQUIREMENTS**

HONDA GENERATOR ENGINE GX390

[RELATED SECTION 01 51 13]

Model Number: EU6500IS

Location: Construction Staging Area

Dimensions:

Length: 33-1/2"

Width: 26-3/8"

Height: 27-1/2"

Weight: 260 lbs

Features:

Noise Level: 60 dB

Displacement: 389 cc

Starting system: recoil, electric

Fuel tank capacity: 4.5 gal

Run time per tankful: 4.7 hrs. @ rated load, 14 hrs. @ 1/4 load

Electrical:

Wattage: 6500 W

Voltage: 120/240 V

Available: Lowes



All Generators

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- Generator Operation
- Generator sound level comparison
- Accessories
- Download Brochure

General Information

- Dealer Locator
- Product Manuals
- Brochures
- Warranty Information
- FAQs



Hover over image to zoom in

EU6500iS

(EU6500iSAN, EU6500iSAC)

- 6500 watts, 120/240V
- Perfect for home back up power, RV's, outdoor events, job sites, and more
- Super quiet
- Fuel efficient - up to 14 hrs on 4.5 gals of gas
- Convenient electric start
- Inverter - stable power for computers and more

MSRP \$4,499.95*

[Shop Online](#) [Share](#)

*Manufacturer's suggested retail price. Price excludes applicable taxes. Dealer sets actual selling price.

Features Specifications Options

| EU6500i | Specifications |
|------------------------|---|
| Engine | Honda GX390 |
| Displacement | 389cc |
| AC Output | 120/240V 6500W max. (54.1/27.1A) 5500W rated (45.8/22.9A) |
| Receptacles | 20A 125V Duplex, 30A 125V Locking Plug, 30A 125/250V Locking Plug |
| DC Output | N/A |
| Starting System | Recoil, electric |
| Fuel Tank Capacity | 4.5 gals. |
| Run Time per Tankful | 4.7 hrs.@ rated load, 14.0 hrs. @ 1/4 load |
| Dimensions (L x W x H) | 33.5" x 26.4" x 27.5" |
| Noise Level | 60 dB @ rated load 52 dB @ 1/4 load |
| Dry Weight | 260 lbs. |
| Residential Warranty | 3 Years |
| Commercial Warranty | 3 Years |

ULTRA TECH CONTAINMENT
[RELATED SECTION 01 51 13]

Model Number: UTI-2351

Location: Construction Staging Area

Dimensions:

Length: 54"

Width: 29-3/4"

Height: 3-1/2"

Weight: 102 lbs

Features:

Sump: 16.5 gal

Suitable for 5 gal

Optional 2' x 4' grating

Approval Certificates

EPA storage regulations

Available: The Tank Depot

Price: \$156.80





866-926-5603



| | | | | | | | | |
|-------------------|----------------|------------------|-------------|-------------------|------------------------|------------------|------------------|------------|
| water tanks | septic tanks | marine tanks | RV tanks | transport tanks | chemical storage tanks | bio-diesel tanks | rain barrels | fuel tanks |
| double wall tanks | IBC containers | spill prevention | landscaping | material handling | laundry trucks | battery boxes | tank accessories | |

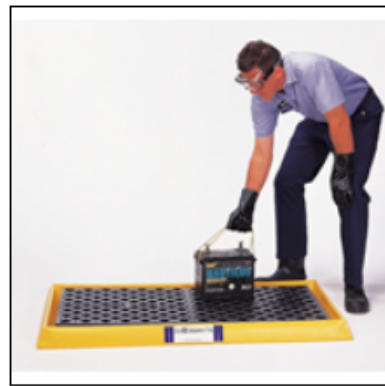
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Ultra Containment Tray w/o Grating



Versatile Secondary Containment For Small Containers And Packages

- Low profile, 16.5 gallon sump is perfect for containment of 5-gallon pails, batteries, safety cans, dry cleaning waste drums and leaky machine parts.
- Optional 2' x 4' grating elevates containers from spilled liquid - features 14 gallon capacity with grating.
- Meets EPA Container Storage Regulations for small packages with grating in place.



Part Number: UTI-2351

Size: 54" x 29 3/4" x 3 1/2"

Weight: 102 lbs.

Ships From: OH

[Freight Calculator](#)

Online Price: \$156.80

DIVISION 06 **WOOD, PLASTICS,
AND COMPOSITES**

SIMPSON TIE 4X4 CONNECTOR**[RELATED SECTION 06 05 23]**

Model Number: ABA44

Location: under Site Wall

Dimensions:

Length: 3-1/8"

Width: 3-9/16"

Height: 3-1/16"

Finish: galvanized

Features:

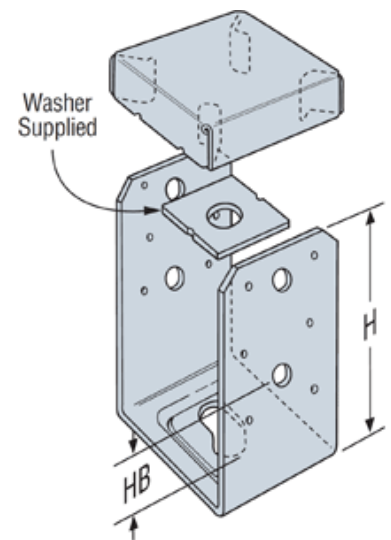
1/2" anchor diameter

16 gauge plate

16 gauge base cover

6-10d nails


Available: Lowes



>> [Home](#) > [All Products - Alphabetical List](#)

AB/ABA/ABE/ABU Adjustable and Standoff Post Bases

 [Print this page](#)

 [Email this page to a friend](#)

Also see [additional standoff bases](#).

The AB is an adjustable post base which offers moisture protection and finished hardware appearance.

These post bases feature 1" standoff height above concrete floors, code-required when supporting permanent structures that are exposed to the weather or water splash, or in basements. They reduce the potential for decay at post and column ends.

Material: AB – 12 gauge plates; 16 gauge base cover; all others – see [table](#).

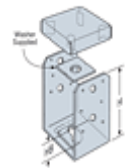
Finish: Galvanized. Some products available in [ZMAX® coating](#); see [Corrosion Information](#).

Installation:

- Use all specified fasteners. See [General Notes](#).
- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non top-supported installations (such as fences or unbraced carports).
- AB supplied as shown; position the post, secure the easy access nut over the supplied washer, place the standoff base, then bend up the fourth side and nail all sides.
- AB, ABA, ABE and ABU - for pre-pour installed anchors. For epoxy or mechanical anchors, select and install according to anchor manufacturer's recommendations; anchor diameter shown in [table](#).
- Products require washers between the nut and the base. Washers are supplied with all products except ABA's which require a standard cut washer.
- Refer to [Anchor Designer Software™ for ACI 318](#) for anchoring solutions.

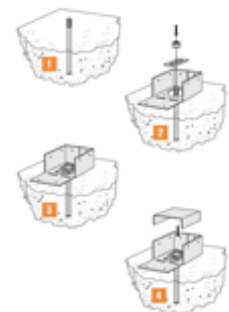


Some products may be installed with the Strong-Drive® SD Structural Connector screw - [click here for details](#)



- ▶ [Load Tables](#)
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INSTALLATION



[View step-by-step installation instructions](#)

AB/ABA/ABE/ABU Adjustable and Standoff Post Bases

Additional standoff bases are on page 199.

The AB is an adjustable post base which offers moisture protection and finished hardware appearance.

These post bases feature 1" standoff height above concrete floors, code-required when supporting permanent structures that are exposed to the weather or water splash, or in basements. They reduce the potential for decay at post and column ends.

MATERIAL: AB—12 gauge plates; 16 gauge base cover; all others—see table

FINISH: Galvanized. Some products available in ZMAX® coating; see Corrosion Information, page 18-19.

INSTALLATION: • Use all specified fasteners. See General Notes.

- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non top-supported installations (such as fences or unbraced carports).
- AB supplied as shown; position the post, secure the easy-access nut over the supplied washer, place the standoff base, then bend up the fourth side and nail all sides.
- AB, ABA, ABE and ABU—for pre-pour installed anchors. For epoxy or mechanical anchors, select and install according to anchor manufacturer's recommendations; anchor diameter shown in table.
- Products require washers between the nut and the base. Washers are supplied with all products except ABA's which require a standard cut washer.

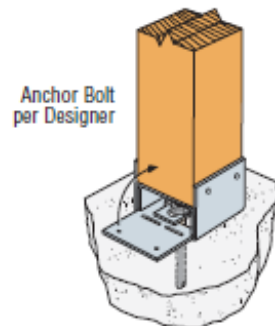
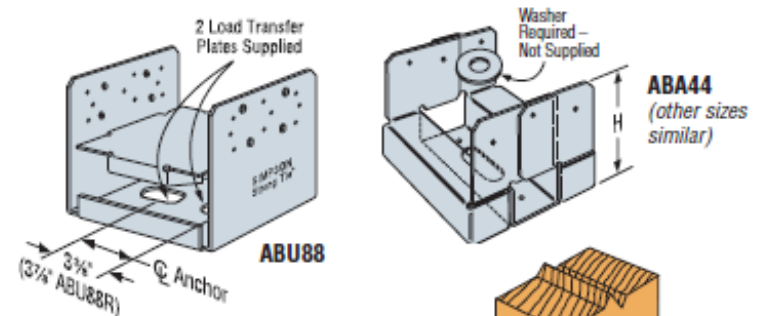
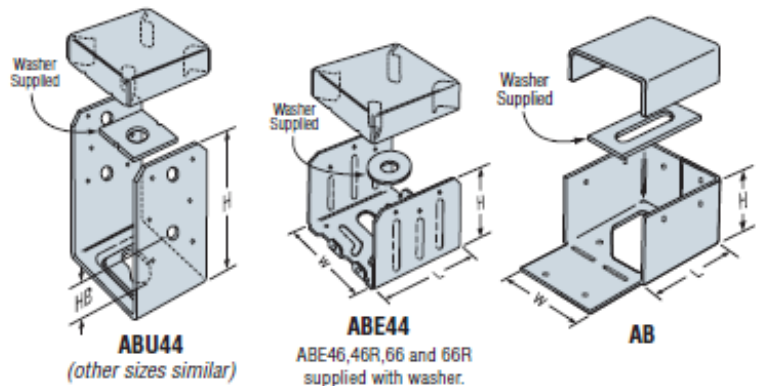
CODES: See page 20 for Code Reference Key Chart.

These products are available with additional corrosion protection. Additional products on this page may also be available with this option, check with Simpson Strong-Tie for details.

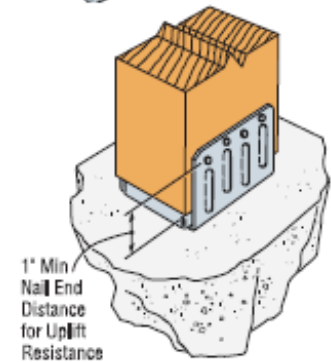
| Model No. | Dimensions | | | Anchor Dia. | Fasteners | Allowable Download (100) | Code Ref. |
|-----------|--------------------------------|--------------------------------|--------------------------------|-------------|-----------|--------------------------|-------------|
| | W | L | H | | | | |
| AB44 | 3 ³ / ₁₆ | 3 ³ / ₁₆ | 2 ¹ / ₄ | 1/2 | 8-10d | 4065 | I3, L18, F1 |
| AB44R | 4 | 4 ¹ / ₁₆ | 2 ³ / ₁₆ | 1/2 | 8-10d | 4065 | |
| AB46 | 3 ³ / ₁₆ | 5 ³ / ₁₆ | 3 | 1/2 | 8-10d | 4165 | |
| AB46R | 4 | 6 | 2 ³ / ₁₆ | 1/2 | 8-10d | 4165 | |
| AB66 | 5 ¹ / ₂ | 5 ³ / ₁₆ | 3 | 1/2 | 8-10d | 5335 | |
| AB66R | 6 | 6 | 2 ³ / ₁₆ | 1/2 | 8-10d | 5335 | |

1. Loads may not be increased for short-term loading.

These products are approved for installation with the Strong-Drive SD Structural-Connector screw. See page 30 for the correct substitution and SD screw size.



Typical AB Installation



Typical ABE46R Installation for Rough Lumber (ABE similar)

| Model No. | Nominal Post Size | Material | | Dimensions | | | | Anchor Dia. | Fasteners | | | Allowable Loads (DF/SP) | | | Code Ref. |
|---------------------|-------------------|-----------|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------|-----------|---------------|--------------|-------------------------|------------|-------|------------|
| | | Base (Ga) | Strap (Ga) | W | L | H | HB ⁵ | | Post | | Uplift (160) | | Down (100) | | |
| | | | | | | | | | Nails | Machine Bolts | Nails | Bolts | | | |
| ABA44 | 4x4 | 16 | 16 | 3 ³ / ₁₆ | 3 ³ / ₁₆ | 3 ³ / ₁₆ | — | 1/2 | 6-10d | — | — | 555 | — | 6000 | I3, F1 |
| ABE44 | 4x4 | 16 | 16 | 3 ³ / ₁₆ | 3 ³ / ₁₆ | 2 ³ / ₁₆ | — | 1/2 | 6-10d | — | — | 520 | — | 6665 | I3, L2, F1 |
| ABU44 | 4x4 | 16 | 12 | 3 ³ / ₁₆ | 3 | 5 ¹ / ₂ | 1 ³ / ₄ | 1/2 | 12-16d | 2 | 1/2 | 2200 | 2160 | 6665 | I3, L2, F1 |
| ABA44R | RGH 4x4 | 16 | 16 | 4 ¹ / ₁₆ | 3 ³ / ₁₆ | 2 ³ / ₁₆ | — | 1/2 | 6-10d | — | — | 555 | — | 8000 | I3, F1 |
| ABE44RZ | RGH 4x4 | 16 | 16 | 4 | 3 ³ / ₁₆ | 2 ³ / ₁₆ | — | 1/2 | 6-10d | — | — | 400 | — | 6665 | 170 |
| ABE46 | 4x6 | 12 | 16 | 3 ³ / ₁₆ | 5 ³ / ₁₆ | 4 ¹ / ₁₆ | — | 3/8 | 8-16d | — | — | 810 | — | 7335 | I3, F1 |
| ABA46 | 4x6 | 14 | 14 | 3 ³ / ₁₆ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 700 | — | 9435 | I3, F1 |
| ABU46 | 4x6 | 12 | 12 | 3 ³ / ₁₆ | 5 | 7 | 2 ³ / ₁₆ | 3/8 | 12-16d | 2 | 1/2 | 2300 | 2300 | 10335 | I3, L2, F1 |
| ABE46R | RGH 4x6 | 12 | 16 | 4 ¹ / ₁₆ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 810 | — | 7335 | 170 |
| ABA46R | RGH 4x6 | 14 | 14 | 4 ¹ / ₁₆ | 5 ³ / ₁₆ | 2 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 700 | — | 12000 | I3, F1 |
| ABA66Z | 6x6 | 14 | 14 | 5 ¹ / ₂ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 720 | — | 10665 | I3, F1 |
| ABE66 | 6x6 | 12 | 14 | 5 ¹ / ₂ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 900 | — | 12000 | I3, F1 |
| ABU66 | 6x6 | 12 | 10 | 5 ¹ / ₂ | 5 | 6 ³ / ₁₆ | 1 ³ / ₄ | 3/8 | 12-16d | 2 | 1/2 | 2300 | 2300 | 12000 | I3, L2, F1 |
| ABA66R | RGH 6x6 | 14 | 14 | 6 | 5 ³ / ₁₆ | 2 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 720 | — | 12665 | I3, F1 |
| ABE66RZ | RGH 6x6 | 12 | 14 | 6 ¹ / ₁₆ | 5 ³ / ₁₆ | 2 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 900 | — | 12000 | 170 |
| ABU88 ⁴ | 8x8 | 14 | 12 | 7 ¹ / ₂ | 7 | 7 | — | 2-3/8 | 18-16d | — | — | 2320 | — | 24335 | I3, F1 |
| ABU88R ⁴ | RGH 8x8 | 14 | 12 | 8 | 7 | 7 | — | 2-3/8 | 18-16d | — | — | 2320 | — | 24335 | 170 |

- Uplift loads have been increased for wind or earthquake with no further increase allowed; reduce where other loads govern.
- Downloads may not be increased for short-term loading.
- Specifier to design concrete for shear capacity.
- ABU products may be installed with either bolts OR nails (not both) to achieve table loads. ABU88 and ABU88R may be installed with 8-SDS 1/4"x3" wood screws (sold separately) for the same table load.

- For AB bases, higher download can be achieved by solidly packing grout under 1" standoff plate before installation. Base download on column, grout, or concrete according to the code.
- HB dimension is the distance from the bottom of the post up to the first bolt hole.
- Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers. For SCL columns, the fasteners for these products should always be installed in the wide face.
- NAILS:** 16d = 0.162" dia. x 3 1/2" long, 10d = 0.148" dia. x 3" long. See page 24-25 for other nail sizes and information.

SIMPSON TIE 6X6 CONNECTOR

[RELATED SECTION 06 05 23]

Model Number: ABE66

Location: under Ramps and Deck

Dimensions:

Length: 5-7/16"

Width: 5-1/2"

Height: 3-1/8"

Finish: galvanized

Features:

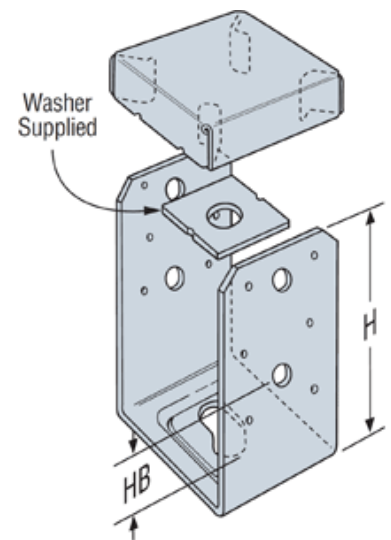
5/8" anchor diameter

12 gauge plate

14 gauge base cover

8-16d nails

Available: Lowes



>> [Home](#) > [All Products - Alphabetical List](#)

AB/ABA/ABE/ABU Adjustable and Standoff Post Bases

 Print this page
 Email this page to a friend

Also see [additional standoff bases](#).

The AB is an adjustable post base which offers moisture protection and finished hardware appearance.

These post bases feature 1" standoff height above concrete floors, code-required when supporting permanent structures that are exposed to the weather or water splash, or in basements. They reduce the potential for decay at post and column ends.

Material: AB – 12 gauge plates; 16 gauge base cover; all others – see [table](#).

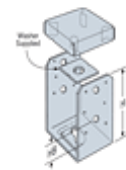
Finish: Galvanized. Some products available in [ZMAX® coating](#); see [Corrosion Information](#).

Installation:

- Use all specified fasteners. See [General Notes](#).
- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non top-supported installations (such as fences or unbraced carports).
- AB supplied as shown; position the post, secure the easy access nut over the supplied washer, place the standoff base, then bend up the fourth side and nail all sides.
- AB, ABA, ABE and ABU - for pre-pour installed anchors. For epoxy or mechanical anchors, select and install according to anchor manufacturer's recommendations; anchor diameter shown in [table](#).
- Products require washers between the nut and the base. Washers are supplied with all products except ABA's which require a standard cut washer.
- Refer to [Anchor Designer Software™ for ACI 318](#) for anchoring solutions.

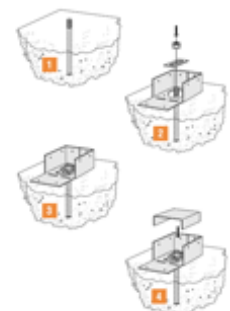


Some products may be installed with the Strong-Drive® SD Structural Connector screw - [click here for details](#)



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INSTALLATION



[View step-by-step installation instructions](#)

AB/ABA/ABE/ABU Adjustable and Standoff Post Bases

Additional standoff bases are on page 199.

The AB is an adjustable post base which offers moisture protection and finished hardware appearance.

These post bases feature 1" standoff height above concrete floors, code-required when supporting permanent structures that are exposed to the weather or water splash, or in basements. They reduce the potential for decay at post and column ends.

MATERIAL: AB—12 gauge plates; 16 gauge base cover; all others—see table

FINISH: Galvanized. Some products available in ZMAX® coating; see Corrosion Information, page 18-19.

INSTALLATION: • Use all specified fasteners. See General Notes.

- Post bases do not provide adequate resistance to prevent members from rotating about the base and therefore are not recommended for non top-supported installations (such as fences or unbraced carports).
- AB supplied as shown; position the post, secure the easy-access nut over the supplied washer, place the standoff base, then bend up the fourth side and nail all sides.
- AB, ABA, ABE and ABU—for pre-pour installed anchors. For epoxy or mechanical anchors, select and install according to anchor manufacturer's recommendations; anchor diameter shown in table.
- Products require washers between the nut and the base. Washers are supplied with all products except ABA's which require a standard cut washer.

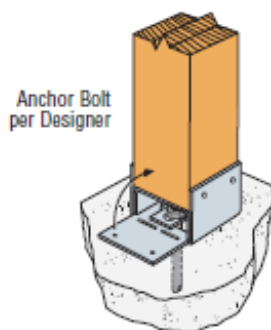
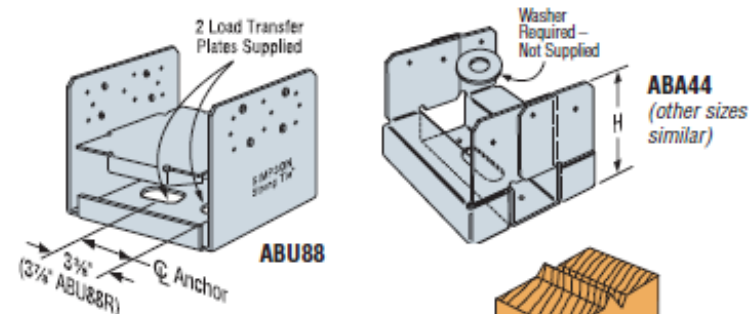
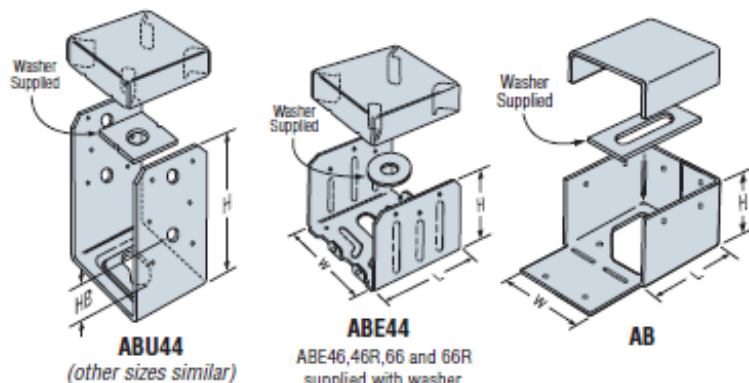
CODES: See page 20 for Code Reference Key Chart.

These products are available with additional corrosion protection. Additional products on this page may also be available with this option, check with Simpson Strong-Tie for details.

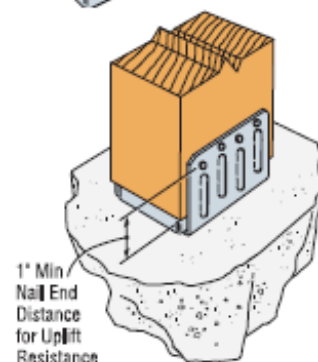
| Model No. | Dimensions | | | Anchor Dia. | Fasteners | Allowable Download (100) | Code Ref. |
|-----------|--------------------------------|--------------------------------|--------------------------------|-------------|-----------|--------------------------|-------------|
| | W | L | H | | | | |
| AB44 | 3 ³ / ₁₆ | 3 ³ / ₁₆ | 2 ¹ / ₄ | 1/2 | 8-10d | 4065 | I3, L18, F1 |
| AB44R | 4 | 4 ¹ / ₁₆ | 2 ⁹ / ₁₆ | 1/2 | 8-10d | 4065 | |
| AB46 | 3 ³ / ₁₆ | 5 | 3 | 1/2 | 8-10d | 4165 | |
| AB46R | 4 | 6 | 2 ⁷ / ₁₆ | 1/2 | 8-10d | 4165 | |
| AB66 | 5 ¹ / ₂ | 5 ³ / ₁₆ | 3 | 1/2 | 8-10d | 5335 | |
| AB66R | 6 | 6 | 2 ¹ / ₁₆ | 1/2 | 8-10d | 5335 | |

1. Loads may not be increased for short-term loading.

These products are approved for installation with the Strong-Drive SD Structural Connector screw. See page 30 for the correct substitution and SD screw size.



Typical AB Installation



Typical ABE46R Installation for Rough Lumber (ABE similar)

| Model No. | Nominal Post Size | Material | | Dimensions | | | | Anchor Dia. | Fasteners | | | Allowable Loads (DF/SP) | | | Code Ref. |
|---------------------|-------------------|-----------|------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------|-----------|--------------------|--------------------|-------------------------|-------|------------|------------|
| | | Base (Ga) | Strap (Ga) | W | L | H | HB ⁵ | | Post | | | Uplift (160) | | Down (100) | |
| | | | | | | | | | Nails | Machine Bolts Qty. | Machine Bolts Dia. | Nails | Bolts | | |
| ABA44 | 4x4 | 16 | 16 | 3 ³ / ₁₆ | 3 ³ / ₁₆ | 3 ³ / ₁₆ | — | 1/2 | 6-10d | — | — | 555 | — | 6000 | I3, F1 |
| ABE44 | 4x4 | 16 | 16 | 3 ³ / ₁₆ | 3 ³ / ₁₆ | 2 ¹ / ₄ | — | 1/2 | 6-10d | — | — | 520 | — | 6665 | I3, L2, F1 |
| ABU44 | 4x4 | 16 | 12 | 3 ³ / ₁₆ | 3 | 5 ¹ / ₂ | 1 ¹ / ₄ | 3/8 | 12-16d | 2 | 1/2 | 2200 | 2160 | 6665 | I3, L2, F1 |
| ABA44R | RGH 4x4 | 16 | 16 | 4 ¹ / ₁₆ | 3 ³ / ₁₆ | 2 ⁹ / ₁₆ | — | 1/2 | 6-10d | — | — | 555 | — | 8000 | I3, F1 |
| ABE44RZ | RGH 4x4 | 16 | 16 | 4 | 3 ³ / ₁₆ | 2 ⁹ / ₁₆ | — | 1/2 | 6-10d | — | — | 400 | — | 6665 | 170 |
| ABE46 | 4x6 | 12 | 16 | 3 ³ / ₁₆ | 5 ³ / ₁₆ | 4 ¹ / ₁₆ | — | 1/2 | 8-16d | — | — | 810 | — | 7335 | I3, F1 |
| ABA46 | 4x6 | 14 | 14 | 3 ³ / ₁₆ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 700 | — | 9435 | I3, F1 |
| ABU46 | 4x6 | 12 | 12 | 3 ³ / ₁₆ | 5 | 7 | 2 ¹ / ₂ | 3/8 | 12-16d | 2 | 1/2 | 2300 | 2300 | 10335 | I3, L2, F1 |
| ABE46R | RGH 4x6 | 12 | 16 | 4 ¹ / ₁₆ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 810 | — | 7335 | 170 |
| ABA46R | RGH 4x6 | 14 | 14 | 4 ¹ / ₁₆ | 5 ³ / ₁₆ | 2 ¹ / ₂ | — | 3/8 | 8-16d | — | — | 700 | — | 12000 | I3, F1 |
| ABA66Z | 6x6 | 14 | 14 | 5 ¹ / ₂ | 5 ¹ / ₂ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 720 | — | 10665 | |
| ABE66 | 6x6 | 12 | 14 | 5 ¹ / ₂ | 5 ³ / ₁₆ | 3 ³ / ₁₆ | — | 3/8 | 8-16d | — | — | 900 | — | 12000 | I3, F1 |
| ABU66 | 6x6 | 12 | 10 | 5 ¹ / ₂ | 5 | 6 ¹ / ₁₆ | 1 ¹ / ₄ | 3/8 | 12-16d | 2 | 1/2 | 2300 | 2300 | 12000 | I3, L2, F1 |
| ABA66R | RGH 6x6 | 14 | 14 | 6 | 5 ³ / ₁₆ | 2 ¹ / ₂ | — | 3/8 | 8-16d | — | — | 720 | — | 12665 | I3, F1 |
| ABE66RZ | RGH 6x6 | 12 | 14 | 6 ¹ / ₁₆ | 5 ³ / ₁₆ | 2 ¹ / ₂ | — | 3/8 | 8-16d | — | — | 900 | — | 12000 | 170 |
| ABU88 ⁴ | 8x8 | 14 | 12 | 7 ¹ / ₂ | 7 | 7 | — | 2-3/8 | 18-16d | — | — | 2320 | — | 24335 | I3, F1 |
| ABU88R ⁴ | RGH 8x8 | 14 | 12 | 8 | 7 | 7 | — | 2-3/8 | 18-16d | — | — | 2320 | — | 24335 | 170 |

- Uplift loads have been increased for wind or earthquake with no further increase allowed; reduce where other loads govern.
- Downloads may not be increased for short-term loading.
- Specifier to design concrete for shear capacity.
- ABU products may be installed with either bolts OR nails (not both) to achieve table loads. ABU88 and ABU88R may be installed with 8-SDS 1/4"x3" wood screws (sold separately) for the same table load.

- For AB bases, higher download can be achieved by solidly packing grout under 1" standoff plate before installation. Base download on column, grout, or concrete according to the code.
- HB dimension is the distance from the bottom of the post up to the first bolt hole.
- Structural composite lumber columns have sides that show either the wide face or the edges of the lumber strands/veneers. For SCL columns, the fasteners for these products should always be installed in the wide face.
- NAILS:** 16d = 0.162" dia. x 3³/₁₆" long, 10d = 0.148" dia. x 3" long. See page 24-25 for other nail sizes and information.

MOISTURE RESISTANT SHEATHING BOARD

[RELATED SECTION 06 16 53]

Model Number: Sheetrock® Mold Tough™

Location: Core Module Bath

Dimensions:

Length: 8'

Width: 4'

Depth: 1/2"

Features:

Enhanced protection against mold and mildew

Moisture resistant

Approval Certificates:

UL Listed

Fire Class A

Available: Lowes

Price: \$11.47





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1/2" x 8' x 4' Moisture-Resistant Drywall

Item #: 313807 | Model #:1248DRT080000

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3/8" x 8' x 4'
Drywall

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Lafarge Gypsum
5/8" T x 8' L x 4' W
Type X...

★★★★★

\$8.49

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Thickness (Inches)

0.5

Mold Resistant

Yes

Facing

Paper

Moisture Resistant

Yes

Fire Rating

None

Fire Resistant

Yes

Length (Feet)

8.0

Moisture Rating

None

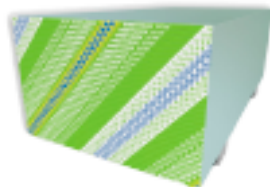
Width (Feet)

4.0

Tile Backer

Yes

Sheetrock® Gypsum Panels



Mold Tough Regular and Firecode® Cores

Quality interior wall and ceiling panels with moisture and mold resistance

- Score and snap easily; no special handling required
- UL Classified as to fire resistance, surface-burning characteristics and noncombustibility
- Install and finish as easily as standard drywall

Description

SHEETROCK® brand MOLD TOUGH™ gypsum panels have a noncombustible, moisture- and mold-resistant gypsum core that is encased in moisture- and mold-resistant, 100 percent recycled green face and brown back papers. The panels feature tapered long edges for easy finishing. The 5/8" FIRECODE® Core and 1/2" FIRECODE C Core panels are UL Classified for fire resistance (Type X).

Regular Core 1/2" Panels Recommended for single-layer application in residential construction

Firecode Core 5/8" Type X Gypsum Panels Provide additional fire resistance over regular panels.

Firecode C Core 1/2" and 5/8" Type C Gypsum Panels Specially formulated mineral core provides fire resistance superior to that offered by FIRECODE Core gypsum panels.

Limitations

1. Avoid exposure to sustained temperatures exceeding 125 °F (52 °C).
2. Avoid exposure to excessive, repetitive or continuous moisture before, during and after installation. Eliminate sources of moisture immediately.
3. Not suitable for use as a substrate for tile in wet areas such as tubs and showers, gang showers and other areas subject to direct water exposure.

Finishing and Decorating

For high-quality finishing results, USG recommends the following products:

- SHEETROCK® ready-mixed joint compounds
- SHEETROCK® setting-type joint compounds
- SHEETROCK® joint tape
- SHEETROCK® First Coat primer
- SHEETROCK® paper faced metal bead and trim
- SHEETROCK® TUFF-HIDE™ primer-surfacer

Painting products and systems should be used which comply with recommendations and requirements in Appendixes of ASTM C840. For priming and decorating with paint, texture or wall covering, follow manufacturer's directions for materials used.

All surfaces, including applied joint compound, must be thoroughly dry, dust-free, and not glossy. Prime with SHEETROCK First Coat primer or with an undiluted, interior latex flat paint with high-solids content. Allow to dry before decorating.

To improve fastener concealment, where gypsum panel walls and ceilings will be subjected to severe artificial or natural side lighting and be decorated with a gloss paint (egg shell, semi-gloss or gloss), the gypsum panel surface should be skim-coated with joint compound. This equalizes suction and texture differences between the drywall face paper and the finished joint compound before painting. As an alternative to skim coating, or when a Level 5 finish is required, use TUFF HIDE™ primer-surfacer.

Product Data

Size: Panels are 1/2" (12.7 mm) or 5/8" (15.9 mm) thick x 4' (1218 mm) wide and available in 8'-12' (2438-4267 mm) lengths.

Weight: Regular: 1/2" (12.7 mm) – 1.6 lbs/sf; FIRECODE C Core: 1/2" (12.7 mm) – 1.9 lbs/sf; 5/8" (15.9 mm) – 2.2 lbs/sf (11.7 kg/sm)

Labeling: Each 5/8" FIRECODE Core, 1/2" FIRECODE C Core and 5/8" FIRECODE C Core panel bears the Underwriters Laboratories, Inc. label mark as evidence of UL Classifications for fire resistance, surface-burning characteristics and noncombustibility.

| | | |
|------------------|-------------------------------------|--|
| Test Data | Moisture and Mold Resistance | <p>Per ASTM C473, the average water absorption for panels is not greater than 5 percent by weight after two-hour immersion.</p> <p>Although all SHEETROCK MOLD TOUGH gypsum panels have improved moisture and mold resistance over standard gypsum panels by treating the core and surface, independent lab tests were conducted on only 5/8" SHEETROCK MOLD TOUGH FIRECODE gypsum panels, 1/2" SHEETROCK MOLD TOUGH FIRECODE C Core gypsum panels (Types X and C), and 5/8" SHEETROCK MOLD TOUGH FIRECODE C Core gypsum panels (Types X and C) at the time of manufacture per ASTM D3273, "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber." The panel score was 10.</p> <p>This ASTM lab test may not accurately represent the mold performance of building materials in actual use. Given unsuitable project conditions during storage, installation or after completion, any building material can be overwhelmed by mold. To manage the growth of mold, the best and most cost-effective strategy is to protect building products from water exposure during storage and installation and after completion of the building. This can be accomplished by using good design and construction practices.</p> |
|------------------|-------------------------------------|--|

| Maximum Frame Spacing Drywall Construction | Direct Application | Panel Thickness ^a | | Location | Application Method ^b | Max. Frame Spacing c.c. | |
|--|--------------------|------------------------------|-----------|---------------------------|---------------------------------|-------------------------|-----|
| | | in. | mm | | | in. | mm |
| Single-Layer | | 1/2 | 12.7 | ceilings | perpendicular | 24 ^d | 610 |
| | | | | | parallel ^e | 16 | 406 |
| | | 5/8 | 15.9 | sidewalls | parallel or perpendicular | 24 | 610 |
| | | | | | parallel ^f | 16 | 406 |
| Double-Layer | 1/2 and 5/8 | 12.7 and 15.9 | ceilings | perpendicular or parallel | 24 ^d | 610 | |
| | | | sidewalls | perpendicular | 24 ^d | 610 | |

(a) 5/8" thickness is recommended for the finest single-layer construction, providing increased resistance to fire and transmission of sound; 1/2" for single-layer application in new residential construction and remodeling. (b) Long edge position relative to framing. (c) Not recommended if water-based texturing material is to be applied. (d) Max. spacing 16" if water-based texturing material is to be applied. (e) Max spacing 16" o.c. if fire rating required.

| | |
|-------------------|---|
| Compliance | <p>SHEETROCK MOLD TOUGH gypsum panels comply with ASTM C1396 and C630.</p> <p>Per ASTM E136, noncombustible gypsum core.</p> <p>Per ASTM E84, flame spread is 15; smoke developed is 0.</p> |
|-------------------|---|

| | | |
|----------------------------|-------------------|-------------|
| Submittal Approvals | Job Name | |
| | Contractor | Date |

Product Information
See usg.com for the most up-to-date product information.
Note
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The following trademarks used herein are owned by United States Gypsum Company or a related company: Firecode, Mold Tough, Sheetrock, Turr-Hoz, USG, USG in stylized letters.

Notice
We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

Safety First!
Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.





SECTION 1
CHEMICAL PRODUCT AND IDENTIFICATION

United States Gypsum Company
 550 West Adams Street
 Chicago, Illinois 60661-3837
 A Subsidiary of USG Corporation

Product Safety: 1 (800) 507-8899
www.usg.com
 Version Date: January 1, 2011
 Version: 4

PRODUCT(S) SHEETROCK® MOLD TOUGH™ Gypsum Panels

CHEMICAL FAMILY / GENERAL CATEGORY Wallboard, Mold Resistant

SYNONYMS Moisture and Mold Resistant Gypsum Panels, Drywall

SECTION 2
HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

ΔWARNING!

This product is not expected to produce any unusual hazards during normal use. Exposure to high dust levels may irritate the skin, eyes, nose, throat, or upper respiratory tract. This product does not present an inhalation, ingestion, or contact health hazard unless subjected to operations such as sawing, sanding or machining which result in the generation of airborne particulate. This product contains quartz (crystalline silica) as a naturally occurring contaminant.

POTENTIAL HEALTH EFFECTS (See Section 11 for more information)

ACUTE :

| | |
|------------|--|
| Inhalation | Exposure to dust generated during the handling or use of the product may cause temporary irritation to eyes, skin, nose, throat, and upper respiratory tract. Persons subjected to large amounts of this dust will be forced to leave area because of nuisance conditions such as coughing, sneezing and nasal irritation. Labored breathing may occur after excessive inhalation. If respiratory symptoms persist, consult physician. |
| Eyes | Dust can cause temporary mechanical irritation of eyes. If burning, redness, itching, pain or other symptoms persist or develop, consult physician. |
| Skin | None known. |
| Ingestion | None known. |

CHRONIC:

| | |
|------------|--|
| Inhalation | The concentration of respirable crystalline silica measured in bulk samples of USG gypsum was less than 0.1 Wt.%. Industrial hygiene testing, following the NIOSH Method 7500, did not detect respirable crystalline silica in dust created during the cutting of USG gypsum wallboard panels by both the recommended score and snap technique and with the use of a power saw in a 10ft by 10ft room. Panels do not release respirable dust in their installed state and therefore do not present any known health hazards when installed and properly maintained. Exposures to respirable crystalline silica are not expected during the normal use of this product; however, actual levels must be determined by workplace hygiene testing. Prolonged and repeated exposure to airborne free respirable crystalline silica can result in lung disease (i.e., silicosis) and/or lung cancer. The development of silicosis may increase the risks of additional health effects. The risk of developing silicosis is dependent upon the exposure intensity and duration. |
|------------|--|



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| | |
|-----------|-------------|
| Eyes | None known. |
| Skin | None known. |
| Ingestion | None known. |

TARGET ORGANS: Eyes, skin and respiratory system.

PRIMARY ROUTES OF ENTRY: Inhalation, eyes and skin contact.

CARCINOGENICITY CLASSIFICATION OF INGREDIENT(S) All substances listed are associated with the nature of the raw materials used in the manufacture of this product and are not independent components of the product formulation. All substances, if present, are at levels well below regulatory limits. See Section 11: Toxicology Information for detailed information.

| MATERIAL | IARC | NTP | ACGIH | CAL- 65 |
|----------------------------------|------|-----|-------|------------|
| Crystalline silica | 1 | 1 | A2 | Listed |
| FibrousGlass/Continuous Filament | 3 | 2 | A4 | Not Listed |

IARC - International Agency for Research on Cancer: 1- Carcinogenic to humans; 2A – Probably carcinogenic to humans; 2B – Possibly carcinogenic to humans; 3 - Not classifiable as a carcinogen; 4 – Probably not a carcinogen

NTP – National Toxicology Program (Health and Human Services Dept., Public Health Service, NIH/NIEHS): 1- Known to be carcinogen; 2- Anticipated to be carcinogens

ACGIH – American Conference of Governmental Industrial Hygienists: A1 – Confirmed human carcinogen; A2 – Suspected human carcinogen; A3 – Animal carcinogen; A4 - Not classifiable as a carcinogen; A5 – Not suspected as a human carcinogen

CAL-65 – California Proposition 65 "Chemicals known to the State of California to Cause Cancer"

Respirable crystalline silica: IARC: Group 1 carcinogen, NTP: Known human carcinogen. The weight percent of crystalline silica given represents total quartz and not the respirable fraction. The weight percent of respirable silica has not been measured in this product.

POTENTIAL ENVIRONMENTAL EFFECTS: Toxicity studies of gypsum performed with fish, aquatic invertebrates and aquatic plants showed no toxic effect. (See Section 12 for more information.)

SECTION 3 COMPOSITION, INFORMATION ON INGREDIENTS

| MATERIAL | WT% | CAS # |
|--|-----|-------------------------|
| Gypsum or Calcium Sulfate Dihydrate (CaSO ₄ •2H ₂ O) | >80 | 13397-24-5/10101-41-4 |
| Cellulose | <10 | 9004-34-6 |
| Starch | <5 | 9005-25-8 |
| Sodium Pyrithione | <2 | 3811-73-2 |
| Crystalline Silica | <5 | 14808-60-7 [^] |
| May Contain: | | [] |
| Fibrous Glass (Continuous Filament) | <1 | 65997-17-3 [#] |

All ingredients of this product are included in the U.S. Environmental Protection Agency's Toxic Substances Control Act Chemical Substance Inventory and the Canadian Domestic Substances List (DSL).

[^]The weight percent for silica represents total quartz and not the respirable fraction.

[#]As manufactured, continuous filament glass fibers are not respirable. Continuous filaments that are chopped, crushed, or severely mechanically processed during manufacture or use may contain very small amounts of respirable particulates.



**SECTION 4
 FIRST AID MEASURES**

FIRST AID PROCEDURES

| | |
|------------|--|
| Inhalation | Remove to fresh air. Leave the area of exposure and remain away until coughing and other symptoms subside. Other measures are usually not necessary, however if conditions warrant, contact physician. |
| Eyes | In case of contact, do not rub or scratch your eyes. To prevent mechanical irritation, flush thoroughly with water for 15 minutes. If irritation persists, consult physician. |
| Skin | Wash with mild soap and water. If irritation persists, consult physician. |
| Ingestion | This product is not intended to be ingested or eaten. If gastric disturbance occurs, call physician. |

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED: Pre-existing upper respiratory and lung diseases such as, but not limited to, bronchitis, emphysema and asthma. Pre-existing skin diseases such as, but not limited to, rashes and dermatitis.

NOTES TO PHYSICIAN: Treatment should be directed at the control of symptoms and the clinical condition.

**SECTION 5
 FIRE FIGHTING MEASURES**

| | | | |
|---|--|------------------------------------|----------------|
| General Fire Hazards | None known | | |
| Extinguishing Media | Water or use extinguishing media appropriate for surrounding fire. | | |
| Special Fire Fighting Procedures | Wear appropriate personal protective equipment. See section 8. | | |
| Unusual Fire/ Explosion Hazards | None known | | |
| Hazardous Combustion Products | None known | | |
| Flash Point | Not Determined | Auto Ignition | Not Applicable |
| Method Used | Not Applicable | Flammability Classification | Not Applicable |
| Upper Flammable Limit (UFL) | Not Determined | Rate of Burning | Not Applicable |
| Lower Flammable Limit (LFL) | Not Determined | | |

**SECTION 6
 ACCIDENTAL RELEASE MEASURES**

CONTAINMENT: Collect panels from spillage and if not damaged or contaminated by foreign material, panels may be reclaimed.

CLEAN-UP: Use normal clean up procedures. No special precautions.

DISPOSAL: Follow all local, state, provincial and federal regulations. Never discharge large releases directly into sewers or surface waters.



SECTION 7
HANDLING AND STORAGE

HANDLING: Avoid dust contact with eyes and skin. Wear the appropriate eye and skin protection against dust (See Section 8). Minimize dust generation and accumulation. Avoid breathing dust. Wear the appropriate respiratory protection against dust in poorly ventilated areas and if TLV is exceeded (see Sections 2 and 8). Use good safety and industrial hygiene practices. When moving board with a forklift or similar equipment, it is essential that the equipment be rated capable of handling the loads. The forks should always be long enough to extend completely through the width of the load. Fork spacing between supports should be one half the length of the panels or base being handled so that a maximum of 4' extends beyond the supports on either end.

Follow traditional building practices; such as management of water away from the interior of the structure to avoid the growth of mold, mildew and fungus. Remove any building products suspected of being exposed to sustained moisture and considered conducive to mold growth from the jobsite.

Gypsum panels are very heavy awkward loads posing the risk of severe back injury. Use proper lifting techniques.

STORAGE: Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities (see Section 10). Protect product from physical damage.

Protect from weather and prevent exposure to sustained moisture.

Gypsum Association literature recommends storing board flat to avoid damaging edges, warping the board and the potential safety hazards of the board falling over. However, in other situations, storing the board flat may cause a tripping hazard or exceed floor limit loads. If stacking board vertically, leave at least 4 inches from the wall to decrease the risk of falling board and no more than 8 inches to avoid too much lateral weight against the wall.

SECTION 8
EXPOSURE CONTROLS/PERSONAL PROTECTION

| MATERIAL | WT% | TLV (mg/m ³) | PEL (mg/m ³) |
|--|-----|--------------------------|--------------------------|
| Gypsum or Calcium Sulfate Dihydrate (CaSO ₄ •2H ₂ O) | >80 | 10 | 15 (T) / 5 (R) |
| Cellulose | <10 | 10 | 15 (T) / 5 (R) |
| Starch | <5 | 10 | 15 (T) / 5 (R) |
| Sodium Pyrrithione | <2 | (NE) | (NE) |
| Crystalline Silica | <5 | 0.025 (R) | 0.1 (R) |
| May Contain: | | [|] |
| Fibrous Glass (Continuous Filament) | <1 | 1 f/cc (R) * | 15 (T) / 5 (R) |

(T)-Total; (R)-Respirable; (NE)-Not Established; (C)-Ceiling; (STEL)-Short-term exposure limit

(F)-Fume; (Du)-Dust; (M)-Mist

ppm-part per million; f/cc-fiber per cubic centimeter; mppcf- million particles per cubic foot

*ACGIH: 1 fiber/cubic centimeter air for fibers longer than 5 micrometers and thinner than 3 micrometers. Continuous filaments that are chopped, crushed, or severely mechanically processed during manufacture or use may contain very small amounts of respirable particulates [PEL = 5 mg/m³(R)].

ENGINEERING CONTROLS: Provide ventilation sufficient to control airborne dust levels. If user operations generate airborne dust, use ventilation to keep dust concentrations below permissible exposure limits. Where general ventilation is inadequate, use process enclosures, local exhaust ventilation, or other engineering controls to control dust levels below permissible exposure limits.



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RESPIRATORY PROTECTION: Wear a NIOSH/MSHA-approved respirator equipped with particulate cartridges when dusty in poorly ventilated areas, and if TLV is exceeded. A respiratory program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. If engineering controls are not possible, wear a properly fitted NIOSH/MSHA-approved particulate respirator.

OTHER PERSONAL PROTECTIVE EQUIPMENT:

| | |
|----------|--|
| Eye/Face | Wear eye protection, safety glasses or goggles, to avoid possible eye contact. |
| Skin | Wear gloves and protective clothing to prevent repeated or prolonged skin contact. |
| General | Selection of Personal Protective Equipment will depend on environmental working conditions and operations. |

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|-----------------------------|---|---|-------------------------|
| Appearance | Green tinted face paper, brown back paper with off white core | Vapor Density (Air = 1) | Not Applicable |
| Odor | Low to no odor | Specific Gravity (H ₂ O = 1) | 2.32 – 2.96 |
| Odor Threshold | Not Determined | Solubility in water (g/100g) | 0.26/100g |
| Physical State | Solid | Partition Coefficient | Not Applicable |
| pH @ 25 ° C | ~ 7 | Auto-ignition Temp | Not Determined |
| Melting Point | Not Applicable | Decomposition Temp | 2650°F/1450°C |
| Freezing Point | Not Applicable | Viscosity | Not Applicable |
| Boiling Point | Not Applicable | Particle Size | Varies |
| Flash Point | Not Determined | Bulk Density | ~ 42 lb/ft ³ |
| Evaporation Rate (BuAc = 1) | Not Applicable | Molecular Weight | ~ 172 |
| Upper Flammable Limit (UFL) | Not Determined | VOC Content | Zero g/L |
| Lower Flammable Limit (LFL) | Not Determined | Percent Volatile | Zero |
| Vapor Pressure (mm Hg) | Not Applicable | | |

SECTION 10 CHEMICAL STABILITY AND REACTIVITY

| | |
|--------------------------|---|
| STABILITY | Stable. |
| CONDITIONS TO AVOID | Contact with incompatibles (see below). |
| INCOMPATIBILITY | None known. |
| HAZARDOUS POLYMERIZATION | None known. |
| HAZARDOUS DECOMPOSITION | None known. |



SECTION 11
TOXICOLOGICAL INFORMATION

ACUTE EFFECTS: The acute oral toxicity study [OECD TG 420] of calcium sulfate dihydrate showed that this chemical did not cause any changes even at 2,000 mg/kg b.w. Therefore, the oral LD50 value was more than 2,000-mg/kg b.w. for female rats. Gypsum paste applied experimentally to the eyes of rabbits was not an irritant. Gypsum dust particulate has shown an irritant action on mucous membranes of the respiratory tract and eyes. The sulfate ion has caused gastro-intestinal disturbance in humans following large oral doses. Limited studies involving the repeated inhalation of an (unspecified) calcium sulfate failed to identify any particular target organs in monkeys, rats and hamsters. No evidence of mutagenicity was found in Ames bacterial tests.

CHRONIC EFFECTS / CARCINOGENICITY: Panels do not release respirable dust in their installed state and therefore do not present any known health hazards when installed and properly maintained.

Crystalline Silica: Exposures to respirable crystalline silica are not expected during the normal use of this product; however, actual levels must be determined by workplace hygiene testing. The weight percent of respirable crystalline silica may not have been measured in this product. Prolonged and repeated exposure to airborne free respirable crystalline silica can result in lung disease (i.e., silicosis) and/or lung cancer. The development of silicosis may increase the risks of additional health effects. Smoking in combination with silica exposures increases the risk of cancer. The risk of developing silicosis is dependent upon the exposure intensity and duration.

In June, 1997, IARC classified crystalline silica (quartz and cristobalite) as a human carcinogen. In making the overall evaluation, the IARC Working Group noted that carcinogenicity in humans was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs.

IARC states that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1).

SECTION 12
ECOLOGICAL INFORMATION

ENVIRONMENTAL TOXICITY: This product has no known adverse effect on ecology. Toxicity studies of gypsum performed with fish, aquatic invertebrates and aquatic plants showed no toxic effect.

| | |
|--------------------------|-----------------|
| Ecotoxicity value | Not determined. |
|--------------------------|-----------------|

SECTION 13
DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Dispose of material in accordance with federal, state, and local regulations. Never discharge directly into sewers or surface waters. Consult with environmental regulatory agencies for guidance on acceptable disposal practices.

SECTION 14
TRANSPORT INFORMATION

U.S. DOT INFORMATION: Not a hazardous material per DOT shipping requirements. Not classified or regulated.



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| | |
|--------------------|-----------------------|
| Shipping Name | Same as product name. |
| Hazard Class | Not classified. |
| UN/NA # | None. Not classified. |
| Packing Group | None. |
| Label (s) Required | Not applicable. |
| GGVSec/MDG-Code | Not classified. |
| ICAO/IATA-DGR | Not applicable. |
| RID/ADR | None. |
| ADNR | None. |

SECTION 15
REGULATORY INFORMATION

UNITED STATES REGULATIONS

All ingredients of this product are included in the U.S. Environmental Protection Agency's Toxic Substances Control Act Chemical Substance Inventory.

| MATERIAL | WT% | 3 0 2 | 3 0 4 | 3 1 3 | CERCLA | CAA Sec. 112 | RCRA Code |
|--|-----|-------------|-------------|-------------|--------|-----------------|--------------|
| Gypsum or Calcium Sulfate Dihydrate (CaSO ₄ •2H ₂ O) | >80 | NL | NL | NL | NL | NL | NL |
| Cellulose | <10 | NL | NL | NL | NL | NL | NL |
| Starch | <5 | NL | NL | NL | NL | NL | NL |
| Sodium Pyrrithione | <2 | NL | NL | NL | NL | NL | NL |
| Crystalline Silica | <5 | NL | NL | NL | NL | NL | NL |
| May Contain: | | [| | | | |] |
| Fibrous Glass (Continuous Filament) | <1 | NL | NL | NL | NL | NL | NL |

Key: NL = Not Listed

SARA Title III Section 302 (EPCRA) Extremely Hazardous Substances: Threshold Planning Quantity (TPQ)

SARA Title III Section 304 (EPCRA) Extremely Hazardous Substances: Reportable Quantity (RQ)

SARA Title III Section 313 (EPCRA) Toxic Chemicals: X= Subject to reporting under section 313

CERCLA Hazardous Substances: Reportable Quantity (RQ)

CAA Section 112 (r) Regulated Chemicals for Accidental Release Prevention: Threshold Quantities(TQ)

RCRA Hazardous Waste: RCRA hazardous waste code

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of Controlled Product regulations and the MSDS contains all the information required by the Controlled Products Regulations. All ingredients of this product are included in the Canadian Domestic Substances List (DSL).

| MATERIAL | WT% | IDL Item # | WHMIS Classification |
|----------|-----|------------|-------------------------|
|----------|-----|------------|-------------------------|



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| | | | |
|--|-----|------------|------------|
| Gypsum or Calcium Sulfate Dihydrate (CaSO ₄ •2H ₂ O) | >80 | Not Listed | Not Listed |
| Cellulose | <10 | Not Listed | Not Listed |
| Starch | <5 | Not Listed | Not Listed |
| Sodium Pyrrithione | <2 | Not Listed | Not Listed |
| Crystalline Silica | <5 | 1406 | D2A |
| May Contain: | | [|] |
| Fibrous Glass (Continuous Filament) | <1 | Not Listed | Not Listed |

IDL Item#: Canadian Hazardous Products Act – Ingredient Disclosure List Item #

WHMIS Classification: Workplace Hazardous Material Information System

Risk and Safety Phrases defined by European Union Directive 67/548/EEC (Annex III and IV)

R-Phrase(s): R38/37/38

S-Phrase(s): S51 S38 S39

SECTION 16 OTHER INFORMATION

Label Information

Δ WARNING!
Dust can cause irritation to eyes, skin and respiratory tract. Wear eye, skin and respiratory protection as necessary per working conditions. If eye contact occurs flush with water for 15 minutes. Do not ingest. If ingested, call physician. If cutting board with a power tool, use a wet or vacuum saw to reduce the amount of dust generated. Panels are heavy and can fall over, causing serious injury or death. Avoid creating a tripping hazard and do not exceed floor limit loads. Product safety information: 800-507-8899 or usg.com. Customer Service: 800 USG-4-YOU (800 874-4968). KEEP OUT OF REACH OF CHILDREN.

INFORMATION FOR HANDLING AND IDENTIFICATION OF CHEMICAL HAZARDS

| | | | | | | |
|---------------|---|--|---------------|---|------------------------------|---------------------|
| NFPA Ratings: | | | HMIS Ratings: | | HEALTH * 1 | 0 = Minimal Hazard |
| Health: | 1 | | Health: | 1 | FLAMMABILITY 0 | 1 = Slight Hazard |
| Fire: | 0 | | Fire: | 0 | PHYSICAL HAZARD 0 | 2 = Moderate Hazard |
| Reactivity: | 0 | | Reactivity: | 0 | PERSONAL PROTECTION E | 3 = Serious Hazard |
| | | | | | | 4 = Severe Hazard |

E – Safety glasses, gloves and dust respirator; * - Contains silica

Key/Legend

| | |
|--------|--|
| ANSI | American National Standards Institute |
| ACGIH | American Conference of Governmental Industrial Hygienists |
| CAA | Clean Air Act |
| CAS | Chemical Abstracts Service (Registry Number) |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act of 1980 |
| CFR | Code of Federal Regulations |
| DOT | United States Department of Transportation |
| DSL | Canadian Domestic Substances List |
| EPA | United States Environmental Protection Agency |



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| | |
|--------|---|
| EPCRA | Emergency Planning & Community Right-to-know Act |
| HMIS | Hazardous Materials Identification System |
| IARC | International Agency for Research on Cancer |
| MSHA | Mine Safety and Health Administration |
| NDSL | Canadian Non-Domestic Substances List |
| NFPA | National Fire Protection Association |
| NIOSH | National Institute for Occupational Safety and Health |
| OSHA | Occupational Health and Safety Administration |
| PEL | Permissible Exposure Limit |
| PPE | Personal Protection Equipment |
| RCRA | Resource Conservation and Recovery Act |
| SARA | Superfund Amendments and Reauthorization Act of 1986 |
| TLV | Threshold Limit Value |
| TSCA | Toxic Substances Control Act |
| UN/NA# | United Nations/North America number |
| WHMIS | Workplace Hazardous Material Information System |

Prepared by:
Product Safety
USG Corporation
550 West Adams Street
Chicago, IL 60661-3637

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his/her own particular use.

END

BLACK LOCUST WOOD VANITY

[RELATED SECTION 06 20 23]

Model Number: Custom

Location: Core Module Bath

Dimensions:

Top of vanity [W x D]: 24" x 24"

Base of vanity [W x H]: 30" x 24"

Finish: natural white vinegar stain and protective clear coat

Features:

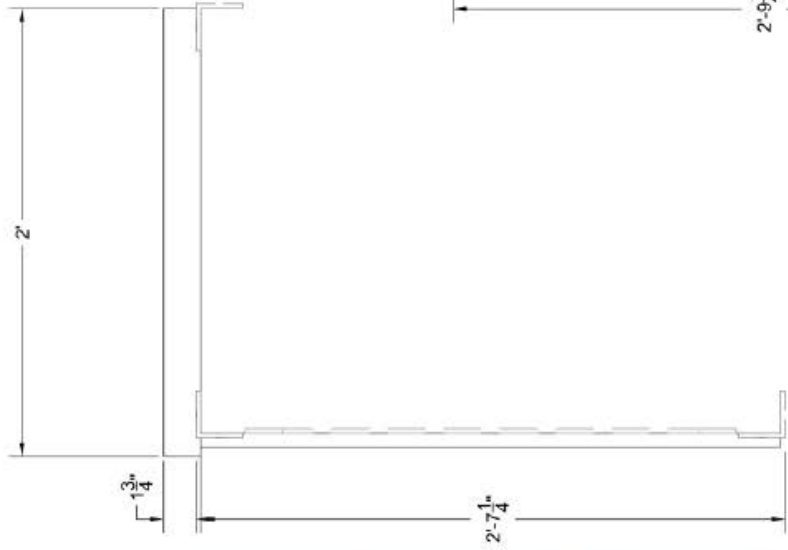
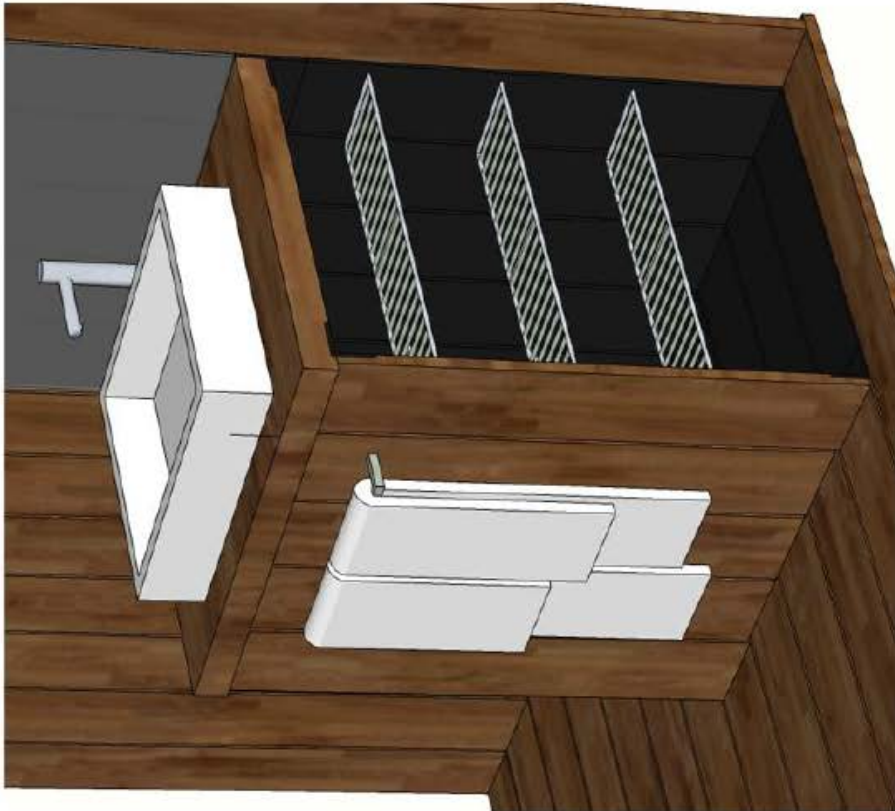
Board size: 5-1/2"

Weight: 48.2 lbs/ft³

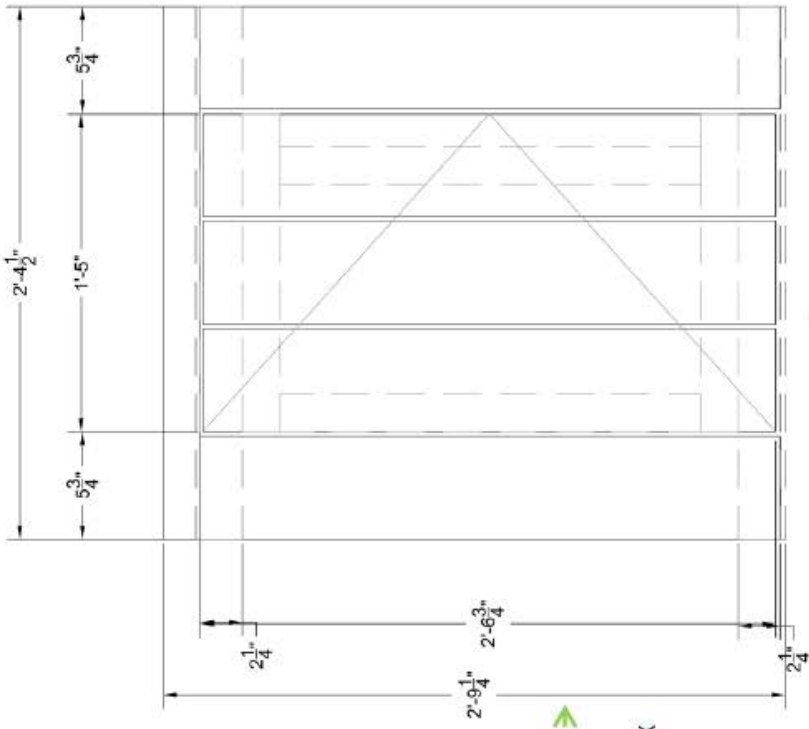
High resistance to insects & decay



bathroom vanity



SIDE VIEW of VANITY
 measurements: 2'0x2'9"H
 * shelving units are spaced evenly from top to bottom



FRONT VIEW of VANITY
 measurements: 2'4 1/2"Wx2'0x2'9"H
 door measurements: 1'5"Wx2'7 1/4"Hx 3/4" thick
 * door hinged on interior & cove cut out of door to fit flush against metal brackets on interior of vanity

GRAINGER DELRIN

[RELATED SECTION 06 61 00]

Model Number: 2VEP6

Location: Core Module Bath

Dimensions:

Length: 12"

Width: 12"

Depth: 1/4"

Finish: white

Features:

150 food contact grade

Temperature range: 32°F- 180°F

Tensile strength: 11,000 psi

Continuous use temperature: 180°F

Heat deflection temperature: 250°F

Available: Grainger

Price: \$22.77



Delrin® Acetal Homopolymer

- Temp. range: 32° to 180°F
- Sheets and round rods

DELIN® 150—FOOD CONTACT GRADE

- Tensile strength: 11,000 psi
- Continuous Use Temperature: 180°F
- Heat Deflection Temperature: 250°F

Offers higher mechanical properties than general purpose acetals. May contain a low-density center, especially in larger cross-sections. For small-diameter, thin-walled bushings. FDA compliant, USDA, NSF, Canada AG.

DELIN® AF BLEND—LOW-FRICTION

- Tensile strength: 8000 psi
- Continuous Use Temperature: 180°F
- Heat Deflection Temperature: 244°F

This 2:1 combination of Delrin AF100 and Delrin 150 has PTFE fibers uniformly dispersed throughout; offers excellent sliding/friction properties and better wear characteristics than unfilled Delrin. Closer static and dynamic coefficient of friction allow higher-speed operation with reduced wear and virtually no slip-stick. For use in moving parts.

| Thickness | | Thickness Tolerance | | 12" x 12"† | | 12" x 24"† | | 12" x 48"† | | 24" x 24"† | | 24" x 48"† | |
|---|--------------------|---------------------|---------|---------------|---------|---------------|----------|---------------|---------|---------------|---------|---------------|---------|
| Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each |
| Delrin® Type 150 Sheets—Food Contact Grade - White | | | | | | | | | | | | | |
| 1/4" | | +0.025/-0.007 | 2VEP6 | 22.77 | 2VER6 | 44.30 | 2VEU1 | 84.90 | 2VEV3 | 84.90 | 2XME3 | 162.75 | |
| 1/2" | | +0.025/-0.007 | 2VEP7 | 37.15 | 2VER8 | 72.25 | 2VEU2 | 138.30 | 2XMD7 | 138.30 | 2XME9 | 264.50 | |
| 3/4" | | +0.025/-0.007 | 2VEP8 | 43.50 | 2VET1 | 84.45 | 2VEU3 | 161.75 | 2XMD8 | 161.75 | 2XMF1 | 309.00 | |
| 1" | | +0.025/-0.007 | 2VEP9 | 59.50 | 2VET2 | 112.50 | 2VEU4 | 220.25 | 2XMD9 | 216.50 | 2XMF2 | 423.00 | |
| 1 1/4" | | +0.025/-0.007 | 2VER1 | 67.20 | 2VET3 | 130.20 | 2VEU5 | 244.00 | 2XME1 | 248.50 | 2XMF3 | 469.00 | |
| 1 1/2" | | +0.025/-0.007 | 2VER2 | 84.55 | 2VET4 | 164.50 | 2VEU6 | 350.75 | 2XME2 | 344.50 | 2XMF4 | 662.50 | |
| 1 3/4" | | +0.025/-0.007 | 2VER3 | 117.60 | 2VET5 | 231.50 | 2VEU7 | 439.25 | 2XME3 | 439.25 | 2XMF5 | 844.50 | |
| 2" | | +0.025/-0.007 | 2VER4 | 142.00 | 2VET6 | 274.75 | 2VEU8 | 517.00 | 2XME4 | 517.00 | 2XMF6 | 994.50 | |
| 2 1/2" | | +0.025/-0.007 | 2VER5 | 188.00 | 2VET7 | 360.25 | 2VEU9 | 684.00 | 2XME5 | 684.00 | 2XMF7 | 1,315.00 | |
| 2 3/4" | | +0.050/-0.007 | 2VER6 | 235.00 | 2VET8 | 456.75 | 2VEV1 | 877.00 | 2XME6 | 877.00 | 2XMF8 | 1,586.00 | |
| 3" | | +0.050/-0.007 | 2VER7 | 281.50 | 2VET9 | 547.50 | 2VEV2 | 1,033.00 | 2XME7 | 1,033.00 | 2XMF9 | 1,985.00 | |
| Delrin® Type AF Sheets - Dark Brown | | | | | | | | | | | | | |
| 1/4" | | +0.025/-0.007 | 2XMT6 | 142.00 | 2XMU1 | 276.25 | 2XMU5 | 530.50 | 2XMU9 | 530.50 | 2XMV4 | 1,020.00 | |
| 1/2" | | +0.025/-0.007 | 2XMT7 | 307.50 | 2XMU2 | 587.00 | 2XMU6 | 1,128.00 | 2XMV1 | 1,128.00 | 2XMV5 | 2,167.00 | |
| 3/4" | | +0.025/-0.007 | 2XMT8 | 403.75 | 2XMU3 | 785.00 | 2XMU7 | 1,507.00 | 2XMV2 | 1,507.00 | 2XMV6 | 2,898.00 | |
| 1" | | +0.025/-0.007 | 2XMT9 | 543.00 | 2XMU4 | 1,056.00 | 2XMU8 | 2,027.00 | 2XMV3 | 2,027.00 | 2XMV7 | 3,898.00 | |
| Dia. | Diameter Tolerance | 1-FL. LENGTH‡ | | 3-FL. LENGTH‡ | | 6-FL. LENGTH‡ | | 1-FL. LENGTH‡ | | 3-FL. LENGTH‡ | | 6-FL. LENGTH‡ | |
| Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each | Item No. | \$ Each |
| Delrin® Type 150 Round Rods—Food Contact Grade - White | | | | | | | | | | | | | |
| 1/4" | +0.003/-0.000* | 2XMG1 | 0.59 | 2XMK2 | 2.08 | 2XMP3 | 2.50 | | | | | | |
| 3/8" | +0.003/-0.000* | 2XMG2 | 0.90 | 2XMK3 | 2.69 | 2XMP4 | 3.36 | | | | | | |
| 1/2" | +0.003/-0.000* | 2XMG3 | 1.13 | 2XMK4 | 3.44 | 2XMP5 | 4.42 | | | | | | |
| 5/8" | +0.003/-0.000* | 2XMG4 | 1.71 | 2XMK5 | 5.12 | 2XMP6 | 6.41 | | | | | | |
| 3/4" | +0.003/-0.000* | 2XMG5 | 1.93 | 2XMK6 | 5.73 | 2XMP7 | 6.86 | | | | | | |
| 7/8" | +0.003/-0.000* | 2XMG6 | 2.50 | 2XMK7 | 7.38 | 2XMP8 | 9.88 | | | | | | |
| 1" | +0.003/-0.000* | 2XMG7 | 2.90 | 2XMK8 | 8.69 | 2XMP9 | 10.65 | | | | | | |
| 1 1/4" | +0.003/-0.000* | 2XMG8 | 3.44 | 2XMK9 | 10.35 | 2XMR1 | 12.87 | | | | | | |
| 1 1/2" | +0.003/-0.000* | 2XMG9 | 5.20 | 2XML1 | 14.86 | 2XMR2 | 19.65 | | | | | | |
| 1 3/4" | +0.003/-0.000* | 2XMH1 | 6.24 | 2XML2 | 18.69 | 2XMR3 | 24.17 | | | | | | |
| 1 3/8" | +0.005/-0.000* | 2XMH2 | 6.50 | 2XML3 | 25.25 | 2XMR4 | 33.30 | | | | | | |
| 1 1/2" | +0.005/-0.000* | 2XMH3 | 9.30 | 2XML4 | 28.25 | 2XMR5 | 38.90 | | | | | | |
| 1 3/4" | +0.005/-0.000* | 2XMH4 | 9.88 | 2XML5 | 29.30 | 2XMR6 | 53.05 | | | | | | |
| 1 1/2" | +0.005/-0.000* | 2XMH5 | 12.85 | 2XML6 | 39.65 | 2XMR7 | 54.75 | | | | | | |
| 1 3/4" | +0.005/-0.000* | 2XMH6 | 12.77 | 2XML7 | 46.05 | 2XMR8 | 65.40 | | | | | | |
| 1 3/8" | +0.005/-0.000* | 2XMH7 | 17.48 | 2XML8 | 52.35 | 2XMR9 | 71.80 | | | | | | |
| 1 1/2" | +0.005/-0.000* | 2XMH8 | 19.09 | 2XML9 | 55.05 | 2XMT1 | 94.60 | | | | | | |
| 2" | +0.005/-0.000* | 2XMH9 | 22.20 | 2XMN1 | 55.40 | 2XMT2 | 103.30 | | | | | | |
| 2 1/4" | +0.015/-0.000* | 2XMJ1 | 24.71 | 2XMN2 | 65.80 | 2XMT3 | 126.50 | | | | | | |
| 2 1/2" | +0.015/-0.000* | 2XMJ2 | 30.75 | 2XMN3 | 85.80 | 2XMT4 | 163.75 | | | | | | |
| 2 3/4" | +0.015/-0.000* | 2XMJ3 | 36.55 | 2XMN4 | 101.30 | 2XMT5 | 187.75 | | | | | | |
| 3" | +0.250/-0.000* | 2XMJ4 | 46.15 | 2XMN5 | 128.10 | | | | | | | | |
| 3 1/4" | +0.250/-0.000* | 2XMJ5 | 69.15 | 2XMN6 | 192.50 | | | | | | | | |
| 4" | +0.250/-0.000* | 2XMJ6 | 78.70 | 2XMN7 | 222.25 | | | | | | | | |
| 4 1/4" | +0.250/-0.000* | 2XMJ7 | 128.50 | 2XMN8 | 346.00 | | | | | | | | |
| 5" | +0.250/-0.000* | 2XMJ8 | 144.65 | 2XMN9 | 405.00 | | | | | | | | |
| 5 1/4" | +0.250/-0.000* | 2XMJ9 | 169.00 | 2XMP1 | 472.75 | | | | | | | | |
| 6" | +0.250/-0.000* | 2XMK1 | 198.25 | 2XMP2 | 545.50 | | | | | | | | |
| Delrin® Type AF Round Rods - Dark Brown | | | | | | | | | | | | | |
| 1/4" | +0.003/-0.000* | 2XMV8 | 2.75 | 2XMX7 | 8.94 | 2XMZ6 | 17.90 | | | | | | |
| 3/8" | +0.003/-0.000* | 2XMV9 | 5.18 | 2XMX8 | 13.75 | 2XMZ7 | 26.45 | | | | | | |
| 1/2" | +0.003/-0.000* | 2XMW1 | 6.91 | 2XMX9 | 19.30 | 2XMZ8 | 37.20 | | | | | | |
| 5/8" | +0.003/-0.000* | 2XMW2 | 8.93 | 2XMY1 | 23.75 | 2XMZ9 | 46.85 | | | | | | |
| 3/4" | +0.003/-0.000* | 2XMW3 | 12.56 | 2XMY2 | 36.95 | 2XNA1 | 67.65 | | | | | | |
| 7/8" | +0.003/-0.000* | 2XMW4 | 16.25 | 2XMY3 | 45.55 | 2XNA2 | 87.55 | | | | | | |
| 1" | +0.003/-0.000* | 2XMW5 | 21.76 | 2XMY4 | 60.90 | 2XNA3 | 117.10 | | | | | | |
| 1 1/4" | +0.003/-0.000* | 2XMW6 | 27.50 | 2XMY5 | 73.25 | 2XNA4 | 140.80 | | | | | | |
| 1 1/2" | +0.005/-0.000* | 2XMW7 | 41.70 | 2XMY6 | 111.15 | 2XNA5 | 214.00 | | | | | | |
| 1 3/4" | +0.005/-0.000* | 2XMW8 | 52.30 | 2XMY7 | 139.45 | 2XNA6 | 268.75 | | | | | | |
| 1 3/8" | +0.005/-0.000* | 2XMW9 | 54.50 | 2XMY8 | 158.75 | 2XNA7 | 302.50 | | | | | | |
| 1 1/2" | +0.005/-0.000* | 2XMX1 | 74.60 | 2XMY9 | 203.00 | 2XNA8 | 383.25 | | | | | | |
| 2" | +0.005/-0.000* | 2XMX2 | 94.55 | 2XME1 | 264.75 | 2XNA9 | 509.50 | | | | | | |
| 2 1/4" | +0.015/-0.000* | 2XMX3 | 130.50 | 2XME2 | 351.50 | 2XNC1 | 675.00 | | | | | | |
| 2 1/2" | +0.015/-0.000* | 2XMX4 | 155.25 | 2XME3 | 434.75 | 2XNC2 | 836.00 | | | | | | |
| 2 3/4" | +0.015/-0.000* | 2XMX5 | 188.25 | 2XME4 | 526.50 | 2XNC3 | 1,012.00 | | | | | | |
| 3" | +0.250/-0.000* | 2XMX6 | 223.50 | 2XME5 | 626.00 | | | | | | | | |

† Width and length tolerances: +0.125/-0.000". ‡ Length tolerance: +0.125/-0.000".

Did You Know?

New legislation raising the minimum efficiency levels for general purpose 3-phase motors took effect on December 19, 2010.

Raising the efficiency levels not only helps save you money on operating costs, but also helps reduce emissions created by the utility companies. Grainger has worked hard to have these motors in stock and ready to meet the new legislation requirements.

Refer to page 8 for more information.

POLYGAL POLYCARBONATE SHEET

[RELATED SECTION 06 64 00]

Model Number: Titan Sky

Location: Bedroom Module, Flex Space, Core Module

Dimensions:

Length: 8'

Width: 4'

Depth: 16 mm for Flex Space and Bedroom Module

Depth: 8 mm for Core Module

Weight: 0.51 lb/ft² [2500 g/m²]

Finish: ice

Features:

Light transmission: 32%

U-factor: 2.08

Minimum radius for cold bending arches: 9'-2"

Available: Polygal

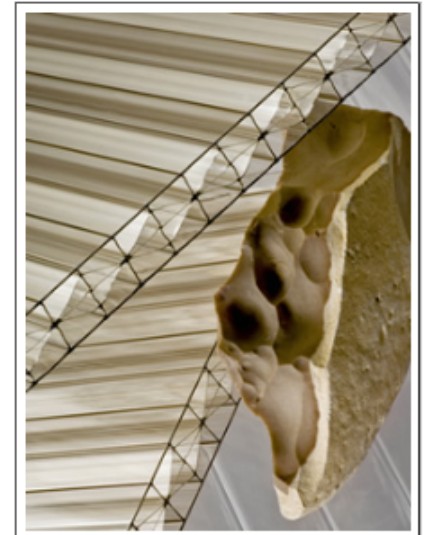


TITAN SKY | INTERNAL CROSS-BRACE STRUCTURE | POLYCARBONATE SHEET

Titan's internal cross-brace structure makes these sheets twice as strong and stiff as the equivalent standard Polycarbonate sheets, without extra weight.

Titan sheets provide extra strength under heavy loads and difficult climatic conditions, without extra cost.

- Reinforced sheet performance without additional weight, compared to 16mm Standard Sheets
- Especially effective under snow loads, hail, tornadoes and other extreme weather conditions - To see sheet performance under loads, go to "[Support / Wind Load Charts](#)".
- Available in super-strength configurations for especially extreme weather conditions (by special order)
- Available with Primalite and Silhouette special coatings
- Recommended Uses: Stadiums, sports facilities, greenhouses and where heavy load support is required.



Technical Specifications:

| Product | Structure | Thickness (mm) | Weight g/m (lb/ft ²) | Standard width (mm) | Minimum radius for cold bending arches, m (inch) | U-factor ASTM C177 TNO(W/m ² X C) (Btu / (h x ft ² x f ²)) |
|-----------|-----------|----------------|----------------------------------|-----------------------|--|--|
| Titan | | 10 | 1700 -0.35 | 1200 2100 (48") | 1.75 (59") | 2.5 (0.45) |
| | | 16 | 2700 -0.55 | | 2.8 (92") | 2.2 (0.36) |
| Titan Sky | | 16 | 2500 -0.51 | 1050 1200 (47.25") | 2.8 (92") | 2.08 (0.41) |

Optical Specification:

| Thickness (mm) | Light Transmission by ASTM D1003 (%) | | | |
|----------------|--------------------------------------|-----------|-----|--------|
| | Clear | Non-Glear | Ice | Bronze |
| 10 | 62 | 25 | 32 | 42 |
| 16 | 62 | 25 | 32 | 42 |

[Download PDF](#)

Titan

Extra Strong, Extra Rigid, Extra Effective Insulation

Polygal Titan internal cross-brace structure gives these panels twice the strength and rigidity of equivalent standard polycarbonate panels. Polygal Titan provides a quality solution that is both intelligent and advanced for use where withstanding heavy loads is required.

Titan Sky sheets combine highly effective thermal insulation with extra strength for low pitch roofing.

Available in different thicknesses, widths and colors. Ideal for low pitched roofs and for glazing in closed structures with large span openings.

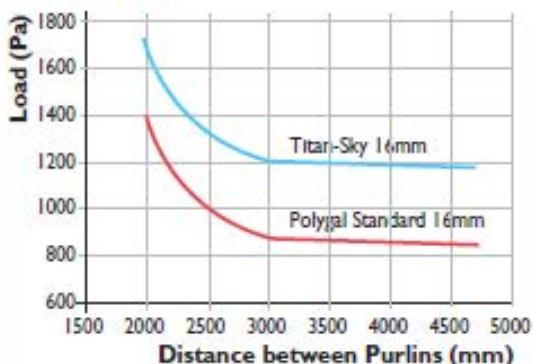
- Suitable for cold climates - extremely low 0.37 U-Value
- Save on heating energy costs
- Bright, transparent look, large range of colours, shades and reflective coatings
- Covered by 10 Year Warranty for color, light transmission and strength
- Can be cold - bent to recommended radii
- Best insulation performance during cold winter nights
- Rigid sheet structure provides extra strength under wind and snow loads
- Recommended Uses: Low pitch coverings, Lean-to conservatories, Large span structures, Stadiums, Closed structures with interior climate control, Industrial windows



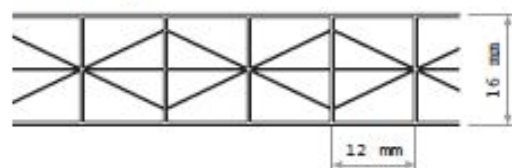
Technical Specifications:

| Product | Thickness (mm) | Weight g/m ² [lb/ft ²] | Standard width (mm) | Minimum radius for cold bending arches | U-Factor ASTM C177 TNO (W/m ² ·°C) [Btu / (h · ft ² · °F)] | Light Transmission ASTM D1003 (%) | | | | |
|-----------|----------------|---|---------------------|--|--|-----------------------------------|-----|-----|--------|----|
| | | | | | | clear | NGL | Ice | bronze | |
| Titan | 10 | 1750 [0.36] | 980 | [48"] | 1.75m [5' 9"] | 2.5 [0.44] | 62 | 25 | 32 | 42 |
| | 16 | 2700 [0.55] | 1050 | | 2.8m [9' 2"] | | | | | |
| Titan Sky | 16 | 2500 [0.51] | 1050 | [47.25"] | 2.8m [9' 2"] | 2.08 [0.37] | | | | |

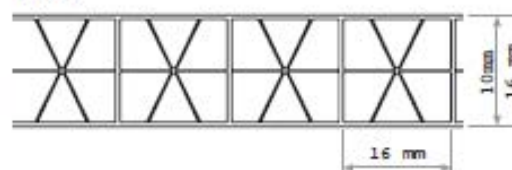
Loads Graph



Titan Sky



Titan



Wind Load vs. length of 16mm Titan Sheets at a constant deflection of 40mm, width 1050mm.

The data in this advertisement is provided in good faith and constitutes general information without commitment, and no warranty is given or implied. Polycarbonate is a combustible thermoplastic material that complies with various international standards, as customary in each country. Avoid exposure to excessive heat or aromatic cleaning solvents. Normal fire precautions should be taken to protect against combustion.

ULINE 20"X36" BURLAP SACK

[RELATED SECTION 06 80 00]

Model Number: S-12332

Location: underneath Ramps, Deck, Site Walls

Dimensions [L x W]:

Length: 20"

Width: 36"

Weight: 10 oz

Features:

Capacity: maximum of 50 lbs

Available: Uline

Price: \$3.46



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20 x 36" Burlap Bags



Ship and store metal parts and hardware.

- Absorbs moisture, oil and grease while allowing airflow.
- Strong 10 oz. natural fibers. Biodegradable.
- Seal with [Cable Ties](#) or choose [Drawstring Bags](#).

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| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. | ADD TO CART | |
|-----------|------------|---------------|-------------|------------------|------|------|-------------|--------------------------------|---------------------|
| | | | | 1 | 5 | 10+ | | <input type="text"/> | ADD |
| S-12332 | 20 x 36" | 10 oz. | 27 | \$62 | \$58 | \$54 | 50 | <input type="text" value="1"/> | ADD |

[Additional Info](#) [Email Page](#)

SAND BAGS



Package heavy parts and supplies, or use as sand-filled flood barriers.

- Woven polypropylene resists punctures and tears.
- Maximum UV protection – Lasts 1,600 hours in the sun.
- Dense, tight weave holds almost any dry substance.
- Hi-vis orange and yellow bags for highway barricades and outdoor use.
- Green suitable for military applications.



PLEASE SPECIFY COLOR: Yellow Orange Green White

| MODEL NO. | SIZE W x L | WT. CAPACITY | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|--------------------------|------------|--------------|-------------|--------------------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-15518 | 10 x 14" | 15 lbs. | 6 | \$30 | \$28 | \$26 | 100 |
| S-11062 | 12 x 20" | 25 lbs. | 7 | 38 | 36 | 34 | |
| S-13896* | 12 x 38" | 90 lbs. | 13 | 59 | 55 | 51 | |
| S-8419 | 14 x 26" | 50 lbs. | 10 | \$39 per bndl. any qty. | | | |

| MODEL NO. | SIZE W x L | WT. CAPACITY | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|--------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-14490 | 18 x 24" | 60 lbs. | 12 | \$48 | \$45 | \$42 | 100 |
| S-8420 | 18 x 30" | 75 lbs. | 15 | 61 | 57 | 53 | |
| S-8421 | 20 x 36" | 100 lbs. | 22 | 70 | 65 | 60 | |
| S-16504 | 24 x 40" | 125 lbs. | 26 | 91 | 85 | 79 | |

*Only available in White

BURLAP BAGS



Ship and store metal parts and hardware.

- Absorbs moisture, oil and grease while allowing airflow.
- Strong 10 oz. natural fibers. Biodegradable.
- Seal with cable ties (page 139) or choose drawstring bags.

BAGS

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. | | |
|-------------------------|------------|---------------|-------------|------------------|------|------|-------------|----|----|
| | | | | 1 | 5 | 10+ | | | |
| S-15522 | 4 x 6' | 10 oz. | 6 | \$37 | \$34 | \$32 | 100 | | |
| S-15523 | 6 x 10' | | 8 | 43 | 40 | 37 | | | |
| S-8422 | 8 x 12' | | 12 | 38 | 35 | 33 | | | |
| S-14515 | 10 x 14' | | 16 | 47 | 44 | 41 | | | |
| S-8423 | 12 x 20' | | 27 | 55 | 52 | 48 | | | |
| S-8424 | 14 x 26' | | 35 | 74 | 69 | 64 | | | |
| S-8425 | 18 x 24' | | 40 | 89 | 83 | 77 | | | |
| S-11053 | 18 x 30' | | 48 | 91 | 85 | 79 | | | |
| S-12332 | 20 x 36' | | 10 oz. | 27 | 62 | 58 | | 54 | 50 |
| S-16508 | 22 x 36' | | | 30 | 69 | 65 | | 60 | |
| S-16509 | 24 x 36' | 31 | | 75 | 70 | 65 | | | |
| S-11054 | 23 x 40' | 30 | | 69 | 65 | 60 | | | |
| S-14516 | 26 x 40' | 32 | | 93 | 87 | 81 | | | |
| S-14517 | 34 x 40' | 36 | | 125 | 117 | 109 | | | |
| S-15524 | 36 x 48' | 51 | | 173 | 161 | 150 | | | |
| S-16510 | 48 x 60' | 10 oz. | | 32 | 144 | 134 | 125 | 25 | |

ROLLS

| MODEL NO. | SIZE W x L | RECOMMENDED USE | LBS./ ROLL | PRICE PER ROLL | | |
|-------------------------|----------------|-----------------|------------|----------------|------|------|
| | | | | 1 | 3 | 5+ |
| S-15519 | 8' x 100 yds. | Tree Wrap | 30 | \$48 | \$44 | \$40 |
| S-14512 | 12' x 100 yds. | | 40 | 62 | 57 | 52 |
| S-14513 | 20' x 100 yds. | Landscaping | 45 | 86 | 79 | 72 |
| S-15520 | 30' x 100 yds. | | 54 | 134 | 123 | 112 |
| S-11055 | 36' x 100 yds. | | 58 | 150 | 138 | 125 |
| S-15521 | 40' x 100 yds. | | 62 | 167 | 153 | 139 |
| S-13899 | 48' x 100 yds. | | 68 | 180 | 165 | 150 |
| S-14514 | 60' x 50 yds. | Construction | 50 | 110 | 101 | 92 |
| S-13900 | 72' x 50 yds. | | 60 | 150 | 138 | 125 |

BAGS WITH TIE

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|---------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-16506 | 14 x 26" | 10 oz. | 35 | \$81 | \$75 | \$70 | 100 |
| S-16507 | 18 x 30" | | 48 | 100 | 94 | 87 | |

BAGS WITH DRAWSTRING

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|---------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-13897 | 4 x 6' | 10 oz. | 6 | \$41 | \$39 | \$36 | 100 |
| S-13898 | 6 x 10' | | 8 | 43 | 40 | 37 | |
| S-15525 | 8 x 12' | | 12 | 62 | 58 | 54 | |
| S-15526 | 10 x 14' | | 16 | 69 | 65 | 60 | |
| S-16505 | 12 x 20' | | 27 | 81 | 75 | 70 | |

ULINE 36"X48" BURLAP SACK

[RELATED SECTION 06 80 00]

Model Number: S-15524

Location: underneath scissor jacks

Dimensions [L x W]:

Length: 36"

Width: 48"

Weight: 10 oz

Features:

Capacity: maximum of 50 lbs

Available: Uline

Price: \$3.46



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36 x 48" Burlap Bags



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Ship and store metal parts and hardware.

- Absorbs moisture, oil and grease while allowing airflow.
- Strong 10 oz. natural fibers. Biodegradable.
- Seal with [Cable Ties](#) or choose [Drawstring Bags](#).

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. | ADD TO CART | |
|-----------|------------|---------------|-------------|------------------|-------|-------|-------------|--------------------------------|------------------------------------|
| | | | | 1 | 5 | 10+ | | <input type="text" value="1"/> | <input type="button" value="ADD"/> |
| S-15524 | 36 x 48" | 10 oz. | 51 | \$173 | \$161 | \$150 | 50 | <input type="text" value="1"/> | <input type="button" value="ADD"/> |

[Additional Info](#)

[Email Page](#)

RECOMMENDED CLOSURES:

- * Cable ties.
- * Tying twine.
- * Hog ring staples.

CAPACITY: Holds up to 50 lbs.

DIMENSIONS: Outside dimensions are listed.

MATERIAL:

- * Bag: Virgin, 100% natural jute fiber.

Unit Weight: 69 lbs.

[Catalog Page 126](#)

SAND BAGS



Package heavy parts and supplies, or use as sand-filled flood barriers.

- Woven polypropylene resists punctures and tears.
- Maximum UV protection – Lasts 1,600 hours in the sun.
- Dense, tight weave holds almost any dry substance.
- Hi-vis orange and yellow bags for highway barricades and outdoor use.
- Green suitable for military applications.

| MODEL NO. | SIZE W x L | WT. CAPACITY | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|--------------------------|------------|--------------|-------------|--------------------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-15518 | 10 x 14' | 15 lbs. | 6 | \$30 | \$28 | \$26 | 100 |
| S-11062 | 12 x 20' | 25 lbs. | 7 | 38 | 36 | 34 | |
| S-13896* | 12 x 38' | 90 lbs. | 13 | 59 | 55 | 51 | |
| S-8419 | 14 x 26' | 50 lbs. | 10 | \$39 per bndl. any qty. | | | |

*Only available in White

■ ■ ■ ■
 PLEASE SPECIFY COLOR: Yellow Orange Green White

| MODEL NO. | SIZE W x L | WT. CAPACITY | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|--------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-14490 | 18 x 24" | 60 lbs. | 12 | \$48 | \$45 | \$42 | 100 |
| S-8420 | 18 x 30" | 75 lbs. | 15 | 61 | 57 | 53 | |
| S-8421 | 20 x 36" | 100 lbs. | 22 | 70 | 65 | 60 | |
| S-16504 | 24 x 40" | 125 lbs. | 26 | 91 | 85 | 79 | |

BURLAP BAGS



Ship and store metal parts and hardware.

- Absorbs moisture, oil and grease while allowing airflow.
- Strong 10 oz. natural fibers. Biodegradable.
- Seal with cable ties (page 139) or choose drawstring bags.

BAGS

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|---------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-15522 | 4 x 6' | 10 oz. | 6 | \$37 | \$34 | \$32 | 100 |
| S-15523 | 6 x 10' | | 8 | 43 | 40 | 37 | |
| S-8422 | 8 x 12' | | 12 | 38 | 35 | 33 | |
| S-14515 | 10 x 14' | | 16 | 47 | 44 | 41 | |
| S-8423 | 12 x 20' | | 27 | 55 | 52 | 48 | |
| S-8424 | 14 x 26' | | 35 | 74 | 69 | 64 | |
| S-8425 | 18 x 24' | | 40 | 89 | 83 | 77 | |
| S-11053 | 18 x 30' | | 48 | 91 | 85 | 79 | |
| S-12332 | 20 x 36' | 10 oz. | 27 | 62 | 58 | 54 | 50 |
| S-16508 | 22 x 36' | | 30 | 69 | 65 | 60 | |
| S-16509 | 24 x 36' | | 31 | 75 | 70 | 65 | |
| S-11054 | 23 x 40' | | 30 | 69 | 65 | 60 | |
| S-14516 | 26 x 40' | | 32 | 93 | 87 | 81 | |
| S-14517 | 34 x 40' | | 36 | 125 | 117 | 109 | |
| S-15524 | 36 x 48' | | 51 | 173 | 161 | 150 | |
| S-16510 | 48 x 60' | | 32 | 144 | 134 | 125 | |

ROLLS

| MODEL NO. | SIZE W x L | RECOMMENDED USE | LBS./ ROLL | PRICE PER ROLL | | |
|-------------------------|----------------|-----------------|------------|----------------|------|------|
| | | | | 1 | 3 | 5+ |
| S-15519 | 8' x 100 yds. | Tree Wrap | 30 | \$48 | \$44 | \$40 |
| S-14512 | 12' x 100 yds. | | 40 | 62 | 57 | 52 |
| S-14513 | 20' x 100 yds. | Landscaping | 45 | 86 | 79 | 72 |
| S-15520 | 30' x 100 yds. | | 54 | 134 | 123 | 112 |
| S-11055 | 36' x 100 yds. | | 58 | 150 | 138 | 125 |
| S-15521 | 40' x 100 yds. | | 62 | 167 | 153 | 139 |
| S-13899 | 48' x 100 yds. | Agricultural | 68 | 180 | 165 | 150 |
| S-14514 | 60' x 50 yds. | | 50 | 110 | 101 | 92 |
| S-13900 | 72' x 50 yds. | | 60 | 150 | 138 | 125 |

BAGS WITH TIE

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|---------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-16506 | 14 x 26" | 10 oz. | 35 | \$81 | \$75 | \$70 | 100 |
| S-16507 | 18 x 30" | | 48 | 100 | 94 | 87 | |

BAGS WITH DRAWSTRING

| MODEL NO. | SIZE W x L | FABRIC WEIGHT | LBS./ BNDL. | PRICE PER BUNDLE | | | QTY./ BNDL. |
|-------------------------|------------|---------------|-------------|------------------|------|------|-------------|
| | | | | 1 | 5 | 10+ | |
| S-13897 | 4 x 6' | 10 oz. | 6 | \$41 | \$39 | \$36 | 100 |
| S-13898 | 6 x 10' | | 8 | 43 | 40 | 37 | |
| S-15525 | 8 x 12' | 10 oz. | 12 | 62 | 58 | 54 | 100 |
| S-15526 | 10 x 14' | | 16 | 69 | 65 | 60 | |
| S-16505 | 12 x 20' | | 27 | 81 | 75 | 70 | |

ABESCO ABS FOUNDATION PADS

[RELATED SECTION 06 80 00]

Model Number: 513

Location: underneath Ramps, Deck, Site Walls, scissor jacks

Dimensions:

Length: 24"

Width: 24"

Depth: 1"

Available: Abseco



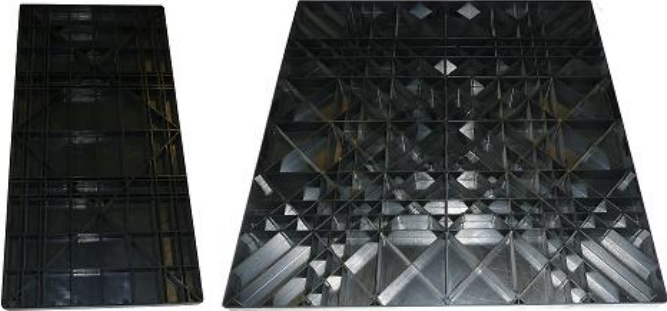
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ABS FOUNDATION PADS, PRESSURE TREATED WOOD and WOOD PRODUCTS

1" x 12" x 24" (Part #500) and 1" x 24" x 24" (Part #513) ABS pads

[State Approved 12 x 24 Plans](#) [State Approved 24 x 24 Plans](#)



1" x 8" x 16" (Part #511) and 2" x 8" x 16" (Part #510) blocking wood



Miner's wedge (Part #509) and pressure treated wood pads available in: 2" x 12" x 24" (Part #504p) and 2" x 12" x 30" (Part #505p).



ADDITIONAL WOOD PRODUCTS

Part #H-104: 2" x 6" x 12' Doug Fir - Pressure Treated
Part #H-105: 2" x 4" x 12' Doug Fir - Pressure Treated
Part #H-106: 2" x 4" x 12' Doug Fir
Part #H-107: 2" x 8" x 12' Doug Fir - Pressure Treated
Part #H-113: 4" x 6" x 36" Doug Fir
Part #H-114: 4" x 10" x 36" Doug Fir
Part #H-116: 2" x 4" x 20' Doug Fir - Pressure Treated
Part #H-117: 2" x 4" x 20' Doug Fir
Part #H-118: 2" x 4" x 14' Doug Fir
Part #H-120: 2" x 10" x 12' Doug Fir - Pressure Treated
Part #H-122: 2" x 12" x 12' Doug Fir - Pressure Treated

RUBBERFORM RECYCLED RUBBER PADS

[RELATED SECTION 06 80 00]

Model Number: Custom

Location: underneath Ramps, Deck, Site Walls, scissor jacks

Dimensions:

Length: 14"

Width: 14"

Depth: varies between 1/2" to 1" depending on site

Features:

Compressive design loads up to 1,500 psi

Ultimate compressive strength of 10,000 psi

Available: RubberForm Recycled Products





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RECYCLED PRODUCTS, LLC

RedWhiteBlue&Green
Red White Blue & Green



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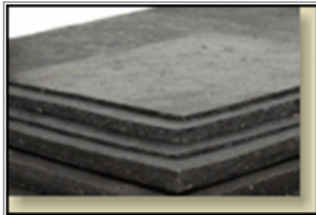


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RubberForm Load Bearing Rubber Pads

RubberForm Load Bearing Rubber Pads are used extensively in standard construction applications, precast and prestressed concrete bridges, buildings and structural steel bearings applications, as well as machinery, equipment foundation, railway tie pads, and shock and vibration isolation. RubberForm Load Bearing Rubber Pads are made from RubberForm masticated rubber which is a fully cured fiber reinforced rubber made from a proprietary blend of recycled rubbers. During the manufacturing process synthetic fibers are added to the base rubber compounds to create an internal stiffening much like steel reinforced concrete. This mesh structure delivers enhanced tensile and compressive strength, stiffness, tear resistance, durability, and superior ozone and weather resistance. These properties cannot be matched by virgin product alone. Our premium grade RubberForm XP Elastomeric Load Bearing Rubber Pads are constructed in a unique cross ply manufacturing process, giving uniform physical properties in all directions. These premium grade load bearing pads are designed for more demanding structural applications with greater load requirements. RubberForm Load Bearing Rubber Pads are manufactured in continuous cure presses, not batch presses, which allow us to economically produce custom shapes and sizes and meet the demands of large scale construction projects. Load bearing pads can be supplied to specified dimensions ready for installation, including required cut outs and holes, or in sheet form for later sizing. Stock sheets are available in 1.219m x 1.219m (48" x 48") and 3.17mm to 25.4 mm (1/8" to 1") thickness. Custom sizes to suit your application. RubberForm elastomeric bearing rubber pads have been used in: • Bridge bearing masonry pads • Lighting standard pad seats • Handrail bearing pads • Pads between steel beams, girders, grates and columns • Pads between bridge and roof beams and substructures. • Shock and vibration isolation • Heavy equipment mounting pads • Railway tie pad applications • Pads underneath concrete vaults • Civil engineering projects RubberForm Load Bearing Rubber Pads are available in two grades – SP and XP.



Got a question?
[Ask Mr. Crumb](#)

- Features
- Specifications
- Photos
- Request A Quote

RubberForm SP Elastomeric Load Bearing Rubber Pads

- Compressive design loads up to 10.3 N/mm2 (1500 psi)
- Ultimate compressive strength of 69.8 N/mm2 (10,000 psi)
- Custom sizes can be made to suit your application
- Waterjet or die cutting available

RubberForm XP Elastomeric Load Bearing Rubber Pads

- Compressive design loads up to 13.8 N/mm2 (2000 psi)
- Ultimate compressive strength of 103.4 N/mm2 (15,000 psi)
- Custom sizes can be made to suit your application
- Waterjet or die cutting available

DIVISION 07 **THERMAL AND
MOISTURE
PROTECTION**

DUPONT TYVEK THERMAWRAP

[RELATED SECTION 07 13 00]

Model Number: D13499991

Location: Main House and Flex OM

Dimensions:

Length: 150'

Width: 9'

Features:

R-Value: R-2

Roll size: 900 ft²

Perm rating: 54

Air penetration resistance: 0.001 cfm/ft²@1.57 psf

Water vapor transmission: 160 g/m²-24 hrs and 250 g/m²-24 hrs

Water penetration resistance: 210 cm

UV exposure: 120 days

Available: Lowes

Price: \$147





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DuPont Tyvek 9' x 150' Roll Housewrap

Item #: 14582 | Model #:D13499991

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\$147.00

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**Pactiv 9' x 150'
Housewrap**

★★★★★

\$107.00



**DuPont Tyvek 2" x
164" HomeWrap...**

Not Yet Rated

\$13.81



**Pactiv 36" x 100'
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Not Yet Rated

\$28.97



**7/16 x 4 x 8 OSB
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\$6.50

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Length (Feet)

150.0

Perm Rating

54.0

Width (Feet)

9.0

GRACE ICE AND WATER SHIELD

[RELATED SECTION 07 13 26]

Model Number: 5003002

Location: Main House and Flex OM

Dimensions:

Length: 75'

Width: 36"

Depth: 40 mil

Weight: 62 lbs

Color: gray-black

Features:

Rolls per pallet: 35

Tensile strength: MD 33 lbf/in

Elongation membrane: 250%

Low temperature flexibility: -20°F

Adhesion to plywood 5.0 lbs./in. width

Permeance: .05 perms

Available: Lowes

Price: \$133





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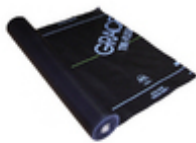
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★★★★★
\$17.00

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Coverage Area (Sq. Feet)

225.0

Felt Grade

N/A

Roll Weight (lbs.)

62.0

Roll Width (Feet)

3.0

Roll Length (Feet)

75.0

Recommended Fastener

N/A

GRACE

Construction Products

1. Product Name

- Grace Ice & Water Shield®
- Grace Select
- Grace Ultra

2. Manufacturer

Grace Construction Products
62 Whittemore Avenue
Cambridge, MA 02140
(866) 333-3SBM (3726)
Fax: (410) 431-7392
www.graceconstruction.com
www.graceathome.com

3. Product Description

BASIC USE

Grace underlayments are used on sloped roofs beneath shingles, shakes, slate, tile and metal roofing. These products help prevent leaks caused by wind driven rain and water back-up from ice dams in flashing areas, on roof edges, valleys, ridges and other critical areas.

Grace Ice & Water Shield® provides superior protection from ice dams and wind driven rain in severe climate areas. With RIPCORDER®, Grace Ice & Water Shield is now easier to install. This "Split Release on Demand" feature (thin cord embedded below the rubberized asphalt) allows splitting the release paper in half. Installation in detailed areas, such as chimneys and valleys, is quicker and easier. Grace Select is appropriate for use in wind driven rain applications and for ice dams where code based standards of protection are sufficient. Grace Ultra is appropriate for applications where the membrane must withstand high in-service temperatures for extended periods of time and is suitable for applications in hot desert southwestern U.S. climates or any application where superior heat resistance is a requirement.

COMPOSITION & MATERIALS

Grace Ice & Water Shield and Grace Select are cold applied, self-adhering membranes composed of a high strength polyethylene film coated on one side with a layer of rubberized asphalt adhesive and interwound with a disposable release sheet. An embossed, slip resistant surface is provided on the polyethylene.

Grace Ultra is a cold applied, self-adhering membrane composed of a high strength polyethylene film coated on one side with a layer of butyl rubber adhesive and interwound with a disposable release sheet. An embossed, slip resistant surface is provided on the polyethylene.

PRECAUTIONS AND LIMITATIONS

- Slippery when wet or covered by frost.
- Consistent with good roofing practice, always wear fall protection when working on a roof deck.
- Release liners are slippery. Remove from work area immediately after membrane application.
- Do not leave permanently exposed to sunlight. Maximum recommended exposure of Grace Select is 30 days, Grace Ice & Water Shield is 30 days and Grace Ultra is 60 days.
- Place metal drip edge or wood starter shingles over the membrane.
- Do not fold over the roof edge unless the edge is protected by a drip edge, gutter or other flashing material.
- Do not install on the chamfered edges of wood plank.
- Do not install directly on old roof coverings.
- Do not install Grace Select or Grace Ice & Water Shield in the desert Southwest. Use Grace Ultra in this climate. Check with your Grace representative.
- Grace Ice & Water Shield and Grace Ultra can be used for high altitude/alpine regions.
- Check with the manufacturer of the metal roofing system for any special requirements when used under metal roofing. Do not install directly under roof coverings especially sensitive to corrosion, such as zinc, without providing proper ventilation.
- Do not install Grace Select or Grace Ice & Water Shield under copper, Cor-Ten® or zinc metal roofing in high altitude climates. These roofs can reach extremely high temperatures due to the low reflectivity, high absorption and high conductivity of the metals. Use Grace Ultra for these roof types in this climate. Check with your Grace representative.
- Provide proper roof insulation and ventilation to help reduce ice dams and to minimize condensation. Grace underlayments are air and vapor barriers.
- Repair holes, fishmouths, tears, and damage to membrane with a round patch of membrane extending past the damaged area 6" (150 mm) in all directions. If fasteners are removed leaving holes in the membrane, it

must be patched. The membrane may not self-seal open fastener penetrations.

- Do not install fasteners through the membrane over unsupported areas of the structural deck, such as over the joints between adjacent structural panels.
- Due to its slight asphaltic odor, do not apply where the membrane is exposed to interior living space.
- Not compatible with polysulphides, flexible PVC or high concentrations of resin (pitch).
- Only Grace Ultra is compatible with EPDMs. Also appropriate for use in tie-ins in EPDM with other Grace underlayments.

4. Technical Data

APPLICABLE STANDARDS

ASTM International

- ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers in Tension
- ASTM D903 Standard Test Method for Peel or Stripping of Adhesive Bonds
- ASTM D1970 Standard Specification for Self-Adhering Polymer-Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
- ASTM D3767 Standard Practice for Rubber-Measurement of Dimensions
- ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials
- ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings

APPROVALS

GIWS meets or exceeds all key code performance requirements for self-adhered underlayments.

LA City Department of Safety Report No. RR-25330, GIWS

International Conference of Building Officials (ICBO ES) - Report No. 3997; Grace Ice & Water Shield, Grace Select, Grace Ultra

Southern Building Code Congress International, Inc. (SBCCI PST and ES) - Report No. 94133C; Grace Ice & Water Shield

Building Officials and Code Administrators International Inc. (BOCA ES) - Report No. 94-33; Grace Ice & Water Shield

Miami Dade County Code NOA 02-1113.02; Grace Ice & Water Shield

Canadian Construction Materials Centre (CCMC) - Report No. 12693-R; Grace Ice & Water Shield

U.S. Department of Housing & Urban Development (HUD) - Materials Release 1056d; Grace Ice & Water Shield

PHYSICAL PROPERTIES

Grace underlayments meet the physical properties and performance characteristics indicated in Table 1.

FIRE RATING

Underwriters Laboratories Inc. (UL)

- ASTM E108/UL 790 Class A fire classification under asphalt, glass fiber mat shingles and Class C under organic felt shingles for Grace Ice & Water Shield, Grace Select and Grace Ultra
- UL Classified Sheathing Material Fire Resistance Classification Design Numbers P225, P227, P230, P237, P259, P508, P510, P512, P514, P701, P711, P717, P722, P723, P732, P734, P736, P742, P803, P814, P818 and P824 for Grace Ice & Water Shield and Grace Ultra

5. Installation

SURFACE PREPARATION

Install Grace underlayments directly on a clean, dry, continuous structural deck. Some suitable deck materials are plywood, wood composition, wood plank, metal, concrete, or gypsum sheathing. For all other sheathings, contact a local Grace representative.

Remove dust, dirt, loose nails and old roofing materials. Protrusions from the deck area

must be removed. Decks shall have no voids, damaged or unsupported areas. Repair deck areas before installing the membrane. Wood planks should be closely butted together.

Prime concrete, masonry surfaces and Dens-Glass Gold® with Perm-A-Barrier® WB Primer if adhesion is found to be marginal. Apply at a rate of 250 - 350 ft²/gal (6 - 8 m²/L). Priming is not required for other suitable surfaces provided that they are clean and dry.

MEMBRANE INSTALLATION

Apply Grace underlayments only in fair weather when the air, roof deck and membrane are at temperatures of 40 degrees F (5 degrees C) or higher. Apply roof covering material at temperatures of 40 degrees F (5 degrees C) or higher.

Cut the membrane into 10' - 15' (3 - 5 m) lengths and reroll loosely. Peel back 7 - 2" (300 - 600 mm) of release liner, align the membrane, and continue to peel the release liner from the membrane. Press the membrane in place with heavy hand pressure. Side laps must be a minimum of 3 1/2" (90 mm), and end laps must be a minimum of 6" (150 mm). For valley and ridge application, peel the release liner, center the sheet over the valley or ridge, drape, and press in place. Use RIPCORDER® to split the release paper for faster and easier installation in these detail areas. Work from the center of the valley or ridge outward in each direction and start at the low point and work up the roof.

Alternatively, starting with a full roll of membrane, unroll a 3' - 6' (1 - 2 m) "starter strip," leaving the release liner in place. Align the membrane and roll in the intended direction of

membrane application. Carefully cut the release liner on top of the full roll in the cross direction being careful not to cut the membrane. Peel back about 6" (150 mm) of the release liner in the opposite direction of the intended membrane application exposing the black adhesive. Hold the release liner with one hand and pull the roll along the deck with the release liner, leaving the starter strip behind. Use the other hand to apply pressure on the top of the roll. Stop frequently to press the membrane in place with heavy hand pressure. When finished with the roll, go back to the beginning, reroll it, and pull the remaining release paper from the material, finishing the installation.

Consistent with good roofing practice, install the membrane so that all laps shed water. Always work from the low point to the high point of the roof. Apply the membrane in valleys before the membrane is applied to the eaves. Following placement along the eaves, continue application of the membrane up the roof. The membrane may be installed either vertically or horizontally.

Use smooth shank, electroplated galvanized nails for fastening shingles. Hand nailing will provide a better seal than power activated nailing. If nailing of the membrane is necessary on steep slopes during hot weather, backnail and cover the nails by overlapping with the next sheet.

Extend the membrane on the roof deck above the highest expected level of water back-up from ice dams and above the highest expected level of snow and ice on the wall sheathing on vertical side walls (dormers) and

TABLE 1 PHYSICAL PROPERTIES OF GRACE UNDERLAYMENTS

| Property & test method | Grace Ice & Water Shield | Grace Select | Grace Ultra |
|---|---|--|--|
| Color | Gray-Black | Gray-Black | Gray-Black |
| Thickness membrane, ASTM D3767, Method A | 40 mil (1.02 mm) | 25 mil (0.64 mm) | 30 mil (0.76 mm) |
| Tensile strength, membrane ASTM D412 (Die C Modified) | 250 psi (1720 kPa) | 250 psi (1720 kPa) | 250 psi (1720 kPa) |
| Elongation, membrane ASTM D412 (Die C Modified) | 250% | 250% | 250% |
| Low temperature flexibility, ASTM D1970 | Unaffected at -20°F (-29°C) | - | Unaffected at -20°F (-29°C) |
| Adhesion to plywood, ASTM D903 | 3 lb/in width (525 N/m) | 3 lb/in width (525 N/m) | 3 lb/in width (525 N/m) |
| Permeance (max), ASTM E96 | 0.05 perms max (2.9 ng/(Pa x s x m ²)) | | 0.05 perms max (2.9 ng/(Pa x s x m ²)) |
| Material weight installed (max) | 0.3 lb/ft ² max (1.3 kg/m ²) | 0.14 lb/ft ² max (0.7 kg/m ²) | 0.22 lb/ft ² max (1.1 kg/m ²) |



vertical front walls for ice dam protection. Consider a double layer of membrane in critical areas, such as along the eaves or in valleys, in climates where severe ice dams are anticipated. Apply the membrane to the entire roof deck for wind driven rain protection. Apply a new layer of Grace underlayment directly over the old Grace underlayment in retrofit applications following the standard membrane application procedure. Place metal drip edges or wood starter shingles over the membrane.

6. Availability & Cost

AVAILABILITY

Strategically located warehouses and dealers stock Grace underlayments throughout North America.

COST

Grace underlayments are competitively priced. For specific information, contact a Grace representative.

7. Warranty

Grace underlayments are warranted to be free of defects in manufacture.

8. Maintenance

When installed in accordance with manufacturer's recommendations, Grace underlayments will not require maintenance.

9. Technical Services

Support is provided by full-time technically trained Grace representatives and technical service personnel, and backed by a central research and development staff. For technical assistance, call toll free (866) 333-3SBM (3726).

10. Filing Systems

- Reed First Source
- Additional product information is available from the manufacturer.

GREENGUARD TYPE IV 1" BOARD INSULATION

[RELATED SECTION 07 21 13]

Location: Main House and Flex OM

Dimensions:

Length: 8'

Width: 4'

Features:

Extruded polystyrene

Thickness: 1"

R-value: 5

Edge treatment: square edge

Minimum compressive strength: 25 psi

Thermal conductivity: 0.2 BTU-in

Flame spread: 15

Smoke development: 140

Available: Lowes



GreenGuard Type IV 25 PSI Insulation Board

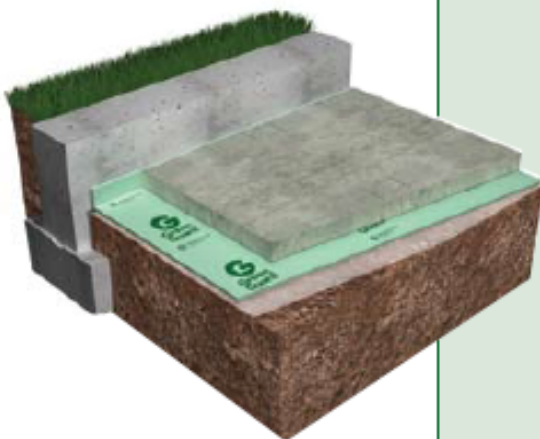
GreenGuard extruded polystyrene (XPS) does not absorb moisture and retains its insulating properties over time, making it an ideal exterior insulation.

- R-Value of 5.0 per inch of thickness increases energy efficiency of structures
- Meets and exceeds all Type IV and Type X specifications
- Lightweight, easy to handle, and easy to cut with a knife

FOR THERMAL
PERFORMANCE,
GO GREEN

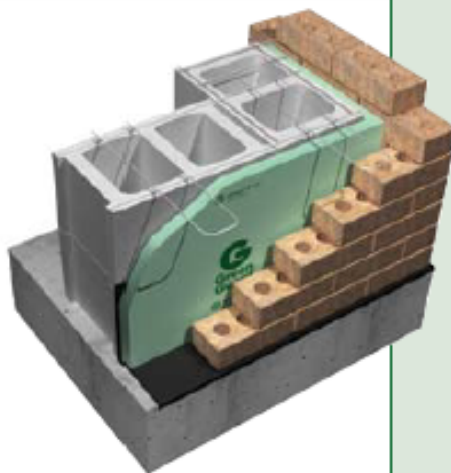
BELOW SLAB

Suitable for normal loading situations, including radiant floors. See your GreenGuard representative for specific loading requirements.



CAVITY WALL

Moisture resistance and R-Value retention make GreenGuard XPS an excellent choice for exterior cavity wall applications. It provides a thermal break over steel studs and helps reduce the potential for condensation in block-backed cavity walls. Score board is 48" wide sheets designed to snap into 16", 24", and 32" widths for a convenient fit between brick ties in block-backed exterior cavity walls.



FOUNDATION

Insulating the exterior of a foundation reduces energy loss and helps control moisture inside the basement. In addition, a layer of durable XPS on the basement exterior helps protect the waterproofing membrane from damage during backfilling. The moisture resistance and R-Value retention of XPS make it an excellent choice for foundation insulation.



1-800-241-4402
www.green-guard.com



THE GREENGUARD® SYSTEM

XPS Insulation is just one component of a comprehensive GreenGuard System that protects against moisture and enhances energy efficiency. To achieve the full benefits of this system, combine insulation with our other product lines.

GreenGuard Type IV 25 PSI Insulation Board

TYPICAL PHYSICAL PROPERTIES

| Property | Test Method | 1" | 1½" | 2" |
|---|--|-----------|-----------|-----------|
| Product Type* | ASTM C 578 | IV | IV | IV |
| Thermal Resistance, R-Value ¹ (°F-ft ² -h/Btu) | ASTM C 518 (@75°F Mean Temperature) | 5 | 7.5 | 10 |
| Thermal Conductivity (Btu-in/hr-ft ² -°F) | ASTM C 518 (@75°F Mean Temp., k) | 0.2 | 0.2 | 0.2 |
| Compressive Strength (min., psi @ 10% Deflection) | ASTM D 1621 | 25 | 25 | 25 |
| Water Absorption (Max. % by Volume) | ASTM C 272 | 0.1 | 0.1 | 0.1 |
| Water Vapor Permeance (perm) | ASTM E 96 Desiccant Method | <1.0 | <1.0 | <1.0 |
| Fire Characteristics ² Flame Spread Smoke Development | ASTM E 84/UL 723 | 15 140 | 15 140 | 15 140 |
| Density (min. pcf) | ASTM C 303 | 1.8 | 1.8 | 1.8 |

*Note: GreenGuard Type IV Board meets or exceeds Type X specifications.

DIMENSIONS/PACKAGING

| Thickness | 1" | 1½" | 2" | 2½" | 3" |
|--------------------|---------|-------|-------|-------|-----|
| Square Feet/Pallet | 3,072 | 2,048 | 1,536 | 1,152 | 960 |
| Pieces/Pallet | 2' x 8' | 192 | 128 | 96 | |
| | 4' x 8' | 96 | 64 | 48 | 30 |

AVAILABILITY

| | | | | | | |
|---------|--------------|---|---|---|---|---|
| 2' x 8' | Square Edge | • | • | • | | |
| | Shiplap Edge | • | | • | | |
| 4' x 8' | Square Edge | • | • | • | • | • |
| | Shiplap Edge | • | | | | |
| | Score Edge | • | • | • | | |



Compliance – For the most current compliance information go to green-guard.com. See ICC-ES Evaluation Report No. ESR-2912, CA BHF TB1334, MN Dept. of Energy Chapter 7640, Underwriters Laboratories, Inc. - See Classification Certificate A183.

GreenGuard® Disclaimers and Footnotes

• **WARNING:** Foam Insulation will ignite if exposed to fire of sufficient heat and intensity. Protect these products from exposure to open flame or other ignition sources during shipping, storage, and installation.

• **Storage and Handling:** When stored outdoors, all product should be protected from exposure to direct sunlight using the original packaging or an opaque, light-colored tarp. Material that has been unwrapped should be covered or rewrapped.

• Pactiv believes the information and recommendations herein to be accurate and reliable. However, since use conditions are not within its control, Pactiv does not guarantee results from use of such products or other information herein and disclaims all liability from any resulting damage or loss. NO WARRANTY, EXPRESS OR IMPLIED, IS GIVEN AS TO THE MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR OTHERWISE WITH RESPECT TO THE PRODUCTS REFERRED TO.

• For more information on specific building product recommendations and installation guidelines, contact your Pactiv representative.

¹Specimens were aged and tested in accordance with FTC Rule (16 CFR, Part 460) and ASTM C 578.

²These numerical flame spread and smoke ratings are not intended to reflect hazards presented by this material under actual fire conditions.

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3/11
PS-25PSI-BRD



1-800-241-4402
www.green-guard.com



JOHN MANVILLE UN-FACED FIBERGLASS BATT INSULATION

[RELATED SECTION 07 21 16]

Model Number: U-1330

Location: Main House and Flex OM interior walls

Dimensions [L x W]:

Length: 93"

Width: 15"

Features:

Thickness: 3-1/2"

R-Value: 13

Coverage: 106.56 ft²

Formaldehyde-free fiber glass

Available: Lowes





Formaldehyde-free® Fiber Glass Insulation

JM FORMALDEHYDE-FREE™ FIBER GLASS INSULATION

JM Formaldehyde-free fiber glass building insulation offers superior thermal and acoustical performance—and it improves indoor air quality, because it's made without formaldehyde. Why is that important? Because the U.S. Environmental Protection Agency (EPA) recommends limiting exposure to formaldehyde as much as possible, and the California Air Resources Board, a division of the California EPA, recommends that homeowners, builders and architects use building materials and insulation made without formaldehyde when building a home or remodeling. JM is the only company in the industry with a complete line of Formaldehyde-free fiber glass building insulation. Visit spec.JM.com for more information.

PRODUCT DESCRIPTION

Johns Manville unfaced insulation is a lightweight thermal and acoustical fiber glass insulation made of long, resilient glass fibers bonded with an acrylic thermosetting binder. Where vapor control is required, a separate vapor retarder can be used.

AVAILABLE FORMS

- Pre-cut batts – fit standard wall cavities and are faster to install than roll products.
- Rolls – can be cut to fit any size wall cavity and installed in any part of a building—especially long unobstructed areas such as attics or crawl spaces.

APPLICATIONS

New Construction

- Wood frame construction – residential homes and light commercial buildings
- Metal frame construction – commercial buildings
- Manufactured homes – modular or manufactured housing
- Engineered wood construction – assemblies framed with 12" to 19.2" (305 mm to 488 mm) on-center cavities, wide-spaced wood trusses or I-joists
- Suspended ceiling systems – sized to fit above 2' x 4' (0.61 m x 1.22 m) ceiling panels
- Interior wall sound control – interior walls, floor and ceiling assemblies. (for sound class ratings for wall assemblies, see the appropriate STC values data sheet for either steel or wood framing).
- Basement wall insulation

Retrofit

- Re-insulating attics, crawl spaces
- Back-fill above suspended ceiling systems

INSTALLATION

Available in many sizes and R-values, unfaced insulation can be quickly installed for a wide variety of applications. JM unfaced insulation cuts easily with an ordinary utility knife and installs by simply pressing in place between studs or joists. Wire rods, chicken wire or wire may be needed to hold insulation in place in horizontal applications. Unfaced insulation must be protected from the outside elements like wind, rain and sunlight.

Note: In colder climate areas, vapor retarders (whether attached to the insulation or applied separately) are often placed toward the heated or conditioned side of the wall. This is done to reduce water vapor penetration into the wall from the building interior. Conversely, in predominantly hot, humid climates local practices often call for placing the vapor retarder toward the outside of the wall cavity. Check your local building codes for vapor retarder requirements.

PACKAGING

Johns Manville unfaced insulation is compression-packaged for savings in storage and freight costs.

RECOMMENDED STORAGE AND TRANSPORT

Store insulation indoors. Keep insulation clean and dry at all times. When transporting, cover completely with a waterproof tarpaulin as necessary.

SPECIFICATION COMPLIANCE

ASTM C 665, Type I
ASTM E 84 Flame Spread 25 or less, Smoke Developed 50 or less

Unfaced

Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation



PERFORMANCE ADVANTAGES

- Improves indoor air quality – because it's made without formaldehyde.
- Thermally efficient – provides effective resistance to heat transfer with R-values up to R-38 (RSI-6.7).
- Controls sound – reduces transmission of sound through exterior and interior walls and floor/ceiling assemblies.
- Fire-resistant and noncombustible – (see Specification Compliance).
- Noncorrosive – does not accelerate corrosion of pipes, wiring or metal studs.
- Mold-resistant – does not support mold or mildew. Does not supply a food source for insects or rodents.
- Resilient – bonded glass fibers will not pull apart during normal applications and resist settling, breakdown and sagging from vibration.
- Flexible – forms readily around corners and curved surfaces.

Unfaced

Visit us at specJM.com

Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation

BUILDING CODE COMPLIANCE AND FIRE HAZARD CLASSIFICATION

| | ICBO | SBCCI | BOCA | IBC/IRC | Flame Spread* | Smoke Developed* |
|---------|-----------|-----------|-----------|---------------------|---------------|------------------|
| Unfaced | All Types | All Types | All Types | All Types/All Types | 25 | 50 |

*Per ASTM E 84.

AVAILABLE FORMS*

| Specification Compliance | R-Value (hr•ft ² •°F/Btu) | RSI-Value (m ² •°C/Watts) | Thickness** | | Width*** | | | |
|--------------------------|--------------------------------------|--------------------------------------|--------------|--------|--------------------|-------------------|--------------------|-------------------|
| | | | (in) | (mm) | Metal Framing (in) | Wood Framing (in) | Metal Framing (mm) | Wood Framing (mm) |
| ASTM C 665 | 38c | 6.7 | 10 1/4 | 260 | — | 15 1/2, 23 1/4 | — | 394, 600 |
| Unfaced | 38 | 6.7 | 13 | 330 | 16, 24 | 16, 24 | 406, 610 | 406, 610 |
| Type I | 30c | 5.3 | 8 1/4 | 210 | — | 15 1/2, 23 1/4 | — | 394, 600 |
| | 30 | 5.3 | 10 1/4 | 260 | 16, 24 | 16, 19, 24 | 406, 610 | 406, 483, 610 |
| | 25 | 4.4 | 8 1/4 | 216 | 16, 24 | 15, 19, 23 | 406, 610 | 381, 483, 584 |
| | 22 | 3.9 | 7 1/2 | 191 | — | 15 | — | 381 |
| | 21 | 3.7 | 5 1/2 | 140 | 16 | 15, 23 | 406 | 381, 584 |
| | 19 | 3.3 | 6 1/2 | 165 | 16, 24 | 15, 19, 23 | 406, 610 | 381, 483, 584 |
| | 15 | 2.6 | 3 1/2 | 89 | — | 15 | — | 381 |
| | 13 | 2.3 | 3 1/2, 3 3/4 | 89, 92 | 16, 24 | 15, 23 | 406, 610 | 381, 584 |
| | 11 | 1.9 | 3 1/2, 3 3/4 | 89, 92 | 16, 24 | 15, 19, 23 | 406, 610 | 381, 483, 584 |
| | Δ | Δ | 2 3/4 | 70 | 16, 24 | — | 406, 610 | — |

* Consult your local JM sales representative or product availability chart for other available sizes and R-Values (RSI-Values) including wide-roll products.

** Thickness may vary by producing location.

*** Special widths and lengths may be available. Check with your local JM sales representative. Standard product lengths include 40', 50' and 90' (1219 mm, 2382 and 2438 mm) batts.

Δ For sound control applications in interior walls.

† Cathedral ceiling application.

SHORT FORM SPECIFICATION

All insulation shown on drawings or specified herein shall be "Johns Manville Unfaced Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation." Thermal resistance "R" (RSI) values of the insulation shall be R (RSI) _____ in ceilings, R (RSI) _____ in walls, and R (RSI) _____ in floors over unheated spaces. The product shall have an FHC rating of 25/50 or less.

LIMITATIONS OF USE

Check applicable building codes.



Technical specifications as shown in this literature are intended to be used as general guidelines only. The physical and chemical properties of unfaced thermal and acoustical fiber glass insulation listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the sales office nearest you for current information. All Johns Manville products are sold subject to Johns Manville's Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville Limited Warranty and Limitation of Remedy or for information on other Johns Manville thermal and acoustical insulation and systems, call or write to the 800 number or address listed below.

Properly insulating a structure using Johns Manville building insulation helps preserve our environment by reducing energy consumption for heating and cooling, reducing the pollution resulting from fuel burning, reducing the emission of hazardous air pollutants during manufacturing and reducing waste through the utilization of recycled materials. Look for the cross and globe emblem on Johns Manville building insulation which indicates independent certification by Scientific Certification Systems, Inc. of 25% or more recycled glass content.



Distributed by:

Insulation Systems

717 17th St.
Denver, CO 80202
(800) 654-3103
specJM.com

Section 1 - Product and Company Identification

Hazard Label WARNING label

Company Information

Johns Manville
Insulation Systems
P.O. Box 5108
Denver, CO 80127 USA

Telephone: 303-978-2000 8:00AM-5:00PM M-F
Internet Address: <http://www.jm.com>
Emergency: 800-424-9300 (Chemtrec, In English)

Trade Names:

Basement Wall Insulation®, Unfaced;
ComfortTherm®;
EasyFit™;
EasyFit®;
Engineered Wood® Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation;
Flex-Glas® PC;
Foil-Faced Batts;
High-Density Blowing Wool;
Kraft-Faced Fiber Glass Insulation;
MR™-Faced;
Microlite® "L", Formaldehyde-free;
Micro-Pak®;

Manufactured Housing Insulation, Formaldehyde-free;
Multi-Purpose Fiber Glass;
Pan-Insul®, Formaldehyde-free;
PEBS Blanket™, Formaldehyde-free;
Pour and Rake Attic Insulation;
Rich-R® Blowing Wool, Formaldehyde-free;
Sound Control Batts;
Sound-SHIELD®;
UMBI®, Formaldehyde-free;
Unfaced Sound Control Batts;
Unfaced Thermal and Acoustical Fiber Glass Insulation;
Wood Frame Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation

Use: For use in commercial, residential, manufactured housing, and metal buildings.

Section 2 - Hazards Identification

Emergency Overview

Inhalation of excessive amounts of dust from the product may cause temporary upper respiratory irritation and/or congestion--remove individual to fresh air.

Inhalation

Irritation of the upper respiratory tract (scratchy throat), coughing, and congestion may occur in extreme exposures.

Skin

Temporary irritation (itching) or redness may occur.

Ingestion

This product is not intended to be ingested (eaten). If ingested, it may cause temporary irritation to the gastrointestinal (digestive) tract.

Eyes

Temporary irritation (itching) or redness may occur.

Ears

Temporary irritation (itching) or redness may occur.

Primary Routes of Entry (Exposure)

Inhalation, skin, and eye contact.

Target Organs

Nose (nasal passages), throat, lungs, skin, eyes

Medical Conditions Aggravated by Exposure

Pre-existing chronic respiratory, skin, or eye diseases or conditions.

Section 3 - Composition/Information on Ingredients

| CAS # | Component | Percent |
|----------------|---|---------|
| Not Applicable | Fiber glass wool | 80-98 |
| Not Available | Acrylic thermoset resin | 2-15 |
| Not Available | Foil/kraft, kraft, FSK, polyethylene, PSK, and various metal building facings | 0-15 |

General Product Description

White fibrous glass board, batt, blanket, or loose-fill insulation with or without tan kraft, blue kraft, FSK, or other facings. No significant odor.

Section 4 - First Aid Measures

First Aid: Inhalation

If dust is inhaled in excess of exposure limits referenced in section 8 of this safety data sheet, remove individual to fresh air. Drink water to clear throat, and blow nose to remove dust. A saline spray in the nose may help clear any fibers.

First Aid: Skin

Wash gently with soap and water to remove dust and fibers. Alternatively, fibers can be removed from the skin by use of ordinary masking or wrapping tape. Should irritation persist, seek medical attention.

First Aid: Ingestion

Rinse mouth with water to remove dust and fibers and drink plenty of water to help reduce irritation. If irritation persists, seek medical attention.

First Aid: Eyes

Do not rub or scratch eyes. Dust particles may cause the eye to be scratched. Flush eyes with large amounts of water until irritation subsides. If irritation persists, seek medical attention.

First Aid: Ears

Wash exposed skin with soap and water. If irritation develops in the inner ear, seek medical attention.

First Aid: Notes to Physician

Dust from the product may cause mechanical irritation of the eyes, skin, and upper respiratory tract. Treat symptomatically.

Section 5 - Fire Fighting Measures

Flash Point: Not applicable

Upper Flammable Limit (UFL): Not applicable

Auto Ignition: Not determined

Rate of Burning: Not determined

General Fire Hazards

There is no potential for spontaneous fire or explosion. Inorganic glass fibers are naturally non-combustible and non-flammable.

Extinguishing Media

Carbon dioxide (CO₂), water, water fog, dry chemical.

Fire Fighting Equipment/Instructions

No special procedures are expected to be necessary for this product. Normal fire fighting procedures should be followed to avoid inhalation of smoke and gases.

Method Used: Not applicable

Lower Flammable Limit (LFL): Not applicable

Flammability Classification: Not determined

Section 6 - Accidental Release Measures

Clean-Up Procedures

Pick up large pieces. Vacuum dusts. If sweeping is necessary, use a dust suppressant such as water. Do not dry sweep dust accumulation. These procedures will help to minimize potential exposures.

Section 7 - Handling and Storage

Handling Procedures

Use protective equipment as described in Section 8 of this safety data sheet when handling uncontained material. Handle in accordance with good industrial hygiene and safety practices.

Storage Procedures

Warehouse storage should be in accordance with package directions, if any. Material should be kept clean, dry, and in original packaging.

Section 8 - Exposure Controls / Personal Protection

The Occupational Safety and Health Administration (OSHA) has not adopted specific occupational exposure standards for fiber glass. Fiber glass is treated as a nuisance dust and is regulated by OSHA as a particulate not otherwise regulated (total dust) shown in CFR 1910.1000 Table Z-3.

Respirable fraction 5 mg/m³

Total dust 15 mg/m³

JM has adopted the fiber glass industry voluntary Product Stewardship Program (PSP), formerly the NAIMA-OSHA Health and Safety Partnership Program (HSPP). Under the PSP, JM recommends that exposures be limited to the voluntary concentration of 1 f/cc TWA for fibers longer than 5 microns with a diameter less than 3 microns. This will help minimize potential irritation effects. The PSP also includes the PPE recommendations described below.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Safety glasses with side shields are recommended to keep dust out of the eyes.

Personal Protective Equipment: Ears

Use ear protection (earplugs, hood, or earmuffs) to prevent airborne dust or fibers from entering the ear, if necessary.

Personal Protective Equipment: Skin

Leather or cotton gloves should be worn to protect against mechanical abrasion. See also Personal Protective Equipment: General, below.

Personal Protective Equipment: Respiratory

A respirator should be used if ventilation is unavailable, or is inadequate for keeping dust and fiber levels below the applicable exposure limits referenced in Section 8 of this SDS. Wear a NIOSH-certified disposable or reusable particulate respirator with an efficiency rating of N95 or higher (per 42 CFR 84) when dust or fiber concentrations exceed the applicable exposure limits. Operations such as sawing, blowing, tear out, and spraying may generate airborne fiber concentrations requiring a higher level of respiratory protection. For exposures up to 50 times the established exposure limits use a full-face respirator, rated N99 or higher.

Ventilation

In fixed manufacturing settings, local exhaust ventilation should be provided at areas of cutting, milling or other processing to remove airborne dust and fibers.

Personal Protective Equipment: General

Wear a cap, a loose-fitting, long-sleeved shirt and long pants to protect skin from irritation. Exposed skin areas should be washed with soap and water after handling or working with fiber glass. Clothing should be washed separately from other clothes, and the washer should be rinsed thoroughly (run empty for a complete wash cycle). This will reduce the chances of fiber glass being transferred to other clothing.

Section 9 - Physical & Chemical Properties

| | | | |
|-------------------------------------|---|--------------------------|---------------------|
| Appearance: | White fibrous glass board, batt, blanket, or loose fiber, with or without various facings | Odor: | No significant odor |
| Physical State: | Solid | pH: | Not applicable |
| Vapor Pressure: | Not applicable | Vapor Density: | Not applicable |
| Boiling Point: | Not applicable | Melting Point: | >704°C/1300°F |
| Solubility (H₂O): | Nil | Specific Gravity: | Variable |
| Freezing Point: | Not applicable | Evaporation Rate: | Not applicable |
| Percent Volatile: | 0 | VOC: | Not determined |

Section 10 - Stability & Reactivity Information

Stability

These products are not reactive.

Hazardous Decomposition

May form carbon dioxide and carbon monoxide.

Hazardous Polymerization

Will not occur.

Section 11 - Toxicological Information

Acute Toxicity

A: General Product Information

Dust from this product is a mechanical irritant, which means that it may cause temporary irritation or scratchiness of the throat, and/or itching of the eyes and skin.

B: Component Analysis - LD50/LC50

No LD50/LC50's are available for this product's components.

Component Carcinogenicity

Fiber glass wool

- ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans
NTP: Reasonably Anticipated To Be A Carcinogen (respirable size)
IARC: Group 3 - Not Classifiable (IARC Monograph 81 [2002] (listed under Man-made mineral fibres),
Monograph 43 [1988])

Chronic Toxicity

The U.S. Department of Health and Human Services, National Toxicology Program (NTP 1998, 2000, 2002) classified glass wool (respirable size) as reasonably anticipated to be a human carcinogen, based on sufficient evidence of carcinogenicity in animals. This assessment was originally prepared in 1993-1994 for the 7th Report on Carcinogens (NTP 1994), but has not been updated since then in the 8th, 9th, or 10th Reports on Carcinogens (NTP 1998, 2000, 2002).

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

No data available for this product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions

A: General Product Information

This product is not expected to be a hazardous waste when it is disposed of according to the U.S. Environmental Protection Agency (EPA) under Resource Conservation and Recovery Act (RCRA) regulations. Product characterization after use is recommended to ensure proper disposal under federal and/or state requirements.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

Section 14 - Transport Information

International Transport Regulations

These products are not classified as dangerous goods according to international transport regulations.

Section 15 - Regulatory Information

US Federal Regulations

A: General Product Information

SARA 311/312: This product is not classified as hazardous under SARA 311/312.

B: Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

State Regulations

A: General Product Information

The glass fibers in this product are not known to be regulated.
Other state regulations may apply. Check individual state requirements.

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

| Component | CAS # |
|------------------|----------------|
| Fiber glass wool | Not Applicable |

TSCA Status

This product and its components are listed on the TSCA 8(b) inventory.

None of the components listed in this product are listed on the TSCA Export Notification 12(b) list.

International Regulations

A: General Product Information

These products are considered articles under both U.S. and international product regulations and as such, these products do not require registration or notification on the various country-specific inventories.

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

| Component | CAS # | Minimum Concentration |
|------------------|----------------|--------------------------------|
| Fiber glass wool | Not Applicable | 1 % (related to Fibrous glass) |

WHMIS Classification

Controlled Product Classification: D2A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations. This SDS contains all the information required by the Controlled Products Regulations.

Section 16 - Other Information

Other Information

Prepared for:
Johns Manville
Insulation Systems
P. O. Box 5108
Denver, CO USA 80217-5108

Prepared by:
Johns Manville Technical Center
P.O. Box 625005
Littleton, CO USA 80162-5005

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

| Date | MSDS # | Reason |
|----------|-------------|---|
| 03/22/05 | 1071-1.0000 | New MSDS for antimony free BI products. |
| 06/06/05 | 1071-1.0001 | Addition of Unfaced Sound Control Batts to Sect. 1 trade names. |
| 06/29/06 | 1071-1.0002 | Removed Insul-SHIELD® Unfaced Boards, Formaldehyde-free from trade names. |
| 07/16/07 | 1071-1.0003 | Regulatory update. Minor edits. |
| 02/29/08 | 1071-1.0004 | Removed Spin-Glas®; Steel Frame Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation from trade names. Added 'Antimony Trioxide-free' to material name. Edited WHMIS classification to D2A for fiber glass wool. |
| 03/03/09 | 1071-1.0005 | Addition of Pour and Rake Attic Insulation to trade names. |
| 06/02/09 | 1071-1.0006 | Addition of FlexGlas PC to trade names. |

End of Sheet 1071

JOHN MANVILLE KRAFT-FACE FIBERGLASS BATT INSULATION

[RELATED SECTION 07 21 16]

Model Number: K834

Location: Main House and Flex OM exterior walls

Dimensions:

Length: 96"

Width: 24"

Features:

Thickness: 6-1/2"

R-Value: 19

Coverage: 144 ft²

Formaldehyde-free fiber glass

Available: Lowes





Formaldehyde-free[™] Fiber Glass Insulation

JM FORMALDEHYDE-FREE[™] FIBER GLASS INSULATION

JM Formaldehyde-free[™] fiber glass building insulation offers superior thermal and acoustical performance—and it improves indoor air quality because it's made without formaldehyde. Why is that important? Because the U.S. Environmental Protection Agency (EPA) recommends limiting exposure to formaldehyde as much as possible, and the California Air Resources Board, a division of the California EPA, recommends that homeowners, builders and architects use building materials and insulation made without formaldehyde when building a home or remodeling. JM is the only company in the industry with a complete line of fiber glass building insulation made without formaldehyde. Visit specJM.com for more information.

PRODUCT DESCRIPTION

Johns Manville Kraft-Faced insulation is a lightweight thermal and acoustical fiber glass insulation made of long, resilient glass fibers bonded with an acrylic thermosetting binder. The kraft facing can serve as an integral vapor retarder.

AVAILABLE FORMS

- Pre-cut batts – fit standard wall cavities and are faster to install than roll products.
- Rolls – can be cut to fit any size cavity and installed in any part of a building.

APPLICATIONS

- Wood frame construction – residential homes and light commercial buildings
- Metal frame construction – commercial buildings
- Pre-manufactured homes – modular or manufactured housing
- Engineered wood construction – assemblies framed with 12" to 19.2" (305 mm to 488 mm) on-center cavities, wide-spaced wood trusses or I-joists
- Interior wall sound control – interior walls and floor and ceiling assemblies (for sound class ratings for wall assemblies, see the appropriate STC values data sheet for either steel or wood framing)

INSTALLATION

Kraft-faced insulation cuts easily with an ordinary utility knife. Stapling tabs are provided for attachment to wood framing. The insulation can also be installed with fasteners or simply pressed in place between studs or joists. The kraft facing on this product will burn and must not be left exposed. It must be covered with gypsum board or another approved interior finish. Where an exposed application is required, use FSK-25 flame-resistant faced insulation.

Note: In colder climate areas, vapor retarders (whether attached to the insulation or applied separately) are often placed toward the heated or conditioned side of the wall. This is done to reduce water vapor penetration into the wall from the building interior. Conversely, in predominantly hot, humid climates local practices often call for placing the vapor retarder toward the outside of the wall cavity. Check your local building codes for vapor retarder requirements.

PACKAGING

This insulation is compression-packaged for savings in storage and freight costs.

RECOMMENDED STORAGE AND TRANSPORT

Store insulation indoors. Keep insulation clean and dry at all times. When transporting, cover completely with a waterproof tarpaulin as necessary.

SPECIFICATION COMPLIANCE

ASTM C 665, Type II, Class C, Category 1
ASTM E 96 Permeability (Kraft) 1.0 Perm

Kraft-Faced

JM Formaldehyde-free[™] Thermal and Acoustical Fiber Glass Insulation



PERFORMANCE ADVANTAGES

- Improves indoor air quality – because it's made without formaldehyde.
- Thermally efficient – provides effective resistance to heat transfer with R-values up to R-38 (RSI-6.7).
- Controls moisture – kraft facing resists water vapor transmission.
- Controls sound – reduces transmission of conversations and equipment noises through interior and exterior walls and floor and ceiling assemblies.
- Noncorrosive – does not accelerate corrosion of pipes, wiring or metal studs.
- Durable – unaffected by moisture, oil, grease and most acids. It will not rot, mildew or otherwise deteriorate.
- Resilient – bonded glass fibers will not pull apart during normal applications and resist settling, breakdown and sagging from vibration.
- Flexible – forms readily around corners and curved surfaces.

BUILDING CODE COMPLIANCE AND FIRE HAZARD CLASSIFICATION

| | ICBO | SBCCI | BOCA | IBC/IRC | Flame Spread* | Smoke Developed* |
|-------------|------------------|------------------|------------------|----------------------------|---------------|------------------|
| Kraft-Faced | Types III, IV, V | Types III, V, VI | Types III, IV, V | Types III, IV, V/All Types | Not Rated | Not Rated |

*For ASTM E 84

AVAILABLE FORMS*

| Specification Compliance | R-Value (hr•ft ² •°F/Btu) | RSI-Value (m ² •°C/Watts) | Thickness** | | Width*** | | | |
|--------------------------|--------------------------------------|--------------------------------------|--------------|--------|--------------------|-------------------|--------------------|--------------------|
| | | | (in) | (mm) | Metal Framing (in) | Wood Framing (in) | Metal Framing (mm) | Wood Framing (mm) |
| ASTM C 665 | 38c | 6.7 | 10 1/4 | 260 | — | 15 1/4, 23 1/4 | — | 394, 600 |
| Kraft-Faced | 38 | 6.7 | 13 | 330 | 16, 24 | 16, 24 | 406, 610 | 406, 610 |
| Type II, Class C | 30c | 5.3 | 8 1/4 | 210 | — | 15 1/4, 23 1/4 | — | 394, 600 |
| Category 1 | 30 | 5.3 | 10 1/4 | 260 | 12, 16, 24 | 12, 16, 19, 24 | 304, 406, 610 | 305, 406, 483, 610 |
| | 25 | 4.4 | 8 1/4 | 216 | — | 15, 23 | — | 381, 584 |
| | 22 | 3.9 | 7 1/4 | 191 | — | 15, 19, 23 | — | 381, 483, 584 |
| | 21 | 3.7 | 5 1/4 | 140 | — | 15, 23 | — | 381, 584 |
| | 19 | 3.3 | 6 1/4 | 165 | 16, 24 | 11, 15, 19, 23 | 406, 610 | 279, 381, 483, 584 |
| | 15 | 2.6 | 3 1/4, 3 3/4 | 89, 92 | — | 15, 23 | — | 381, 584 |
| | 13 | 2.3 | 3 1/4, 3 3/4 | 89, 92 | 16, 24 | 11, 15, 23 | 406, 610 | 279, 381, 584 |
| | 11 | 1.9 | 3 1/4, 3 3/4 | 89, 92 | 16, 24 | 11, 15, 23 | 406, 610 | 279, 381, 584 |

* Consult your local JM sales representative or product availability chart for other available sizes and R-values (RSI-values).

** Thickness may vary by producing location.

*** Special widths and lengths may be available. Check with your local JM sales representative. Standard product lengths include 40", 80" and 96" (1.02 m, 2.36 m and 2.44 m) bats.

c Cathedral ceiling application

SHORT FORM SPECIFICATION

All insulation shown on drawings or specified herein shall be "Johns Manville Kraft-Faced Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation." Thermal resistance "R" values (RSI) of the insulation shall be R (RSI) _____ in ceilings, R (RSI) _____ in walls, and R (RSI) _____ in floors over unheated spaces.

LIMITATIONS OF USE

Check applicable building codes. Kraft-faced insulation should not be left exposed.



Properly insulating a structure using Johns Manville building insulation helps preserve our environment by reducing energy consumption for heating and cooling, reducing the pollution resulting from fuel burning, reducing the emission of hazardous air pollutants during manufacturing and reducing waste through the utilization of recycled materials. Look for the cross and globe emblem on Johns Manville building insulation which indicates independent certification by Scientific Certification Systems, Inc. of 25% or more recycled glass content.

Technical specifications as shown in this literature are intended to be used as general guidelines only. The physical and chemical properties of kraft-faced thermal and acoustical fiber glass insulation listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the sales office nearest you for current information. All Johns Manville products are sold subject to Johns Manville's Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville Limited Warranty and Limitation of Remedy or for information on other Johns Manville thermal and acoustical insulation and systems, call or write to the 800 number or address listed below.



Distributed by:

Insulation Systems

717 17th St.
Denver, CO 80202
(800) 654-3103
specJM.com

Section 1 - Product and Company Identification

Hazard Label WARNING label

Company Information

 Johns Manville
 Insulation Systems
 P.O. Box 5108
 Denver, CO 80127 USA

 Telephone: 303-978-2000 8:00AM-5:00PM M-F
 Internet Address: <http://www.jm.com>
 Emergency: 800-424-9300 (Chemtrec, In English)

Trade Names:

| | |
|---|--|
| Basement Wall Insulation®, Unfaced; ComfortTherm®; EasyFit™; EasyFit®; Engineered Wood® Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation; Flex-Glas® PC; Foil-Faced Batts; High-Density Blowing Wool; Kraft-Faced Fiber Glass Insulation; MR™-Faced; Microlite® "L", Formaldehyde-free; Micro-Pak®; | Manufactured Housing Insulation, Formaldehyde-free; Multi-Purpose Fiber Glass; Pan-Insul®, Formaldehyde-free; PEBS Blanket™, Formaldehyde-free; Pour and Rake Attic Insulation; Rich-R® Blowing Wool, Formaldehyde-free; Sound Control Batts; Sound-SHIELD®; UMBI®, Formaldehyde-free; Unfaced Sound Control Batts; Unfaced Thermal and Acoustical Fiber Glass Insulation; Wood Frame Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation |
|---|--|

Use: For use in commercial, residential, manufactured housing, and metal buildings.

Section 2 - Hazards Identification

Emergency Overview

Inhalation of excessive amounts of dust from the product may cause temporary upper respiratory irritation and/or congestion--remove individual to fresh air.

Inhalation

Irritation of the upper respiratory tract (scratchy throat), coughing, and congestion may occur in extreme exposures.

Skin

Temporary irritation (itching) or redness may occur.

Ingestion

This product is not intended to be ingested (eaten). If ingested, it may cause temporary irritation to the gastrointestinal (digestive) tract.

Eyes

Temporary irritation (itching) or redness may occur.

Ears

Temporary irritation (itching) or redness may occur.

Primary Routes of Entry (Exposure)

Inhalation, skin, and eye contact.

Target Organs

Nose (nasal passages), throat, lungs, skin, eyes

Medical Conditions Aggravated by Exposure

Pre-existing chronic respiratory, skin, or eye diseases or conditions.

Section 3 - Composition/Information on Ingredients

| CAS # | Component | Percent |
|----------------|---|---------|
| Not Applicable | Fiber glass wool | 80-98 |
| Not Available | Acrylic thermoset resin | 2-15 |
| Not Available | Foil/kraft, kraft, FSK, polyethylene, PSK, and various metal building facings | 0-15 |

General Product Description

White fibrous glass board, batt, blanket, or loose-fill insulation with or without tan kraft, blue kraft, FSK, or other facings. No significant odor.

Section 4 - First Aid Measures

First Aid: Inhalation

If dust is inhaled in excess of exposure limits referenced in section 8 of this safety data sheet, remove individual to fresh air. Drink water to clear throat, and blow nose to remove dust. A saline spray in the nose may help clear any fibers.

First Aid: Skin

Wash gently with soap and water to remove dust and fibers. Alternatively, fibers can be removed from the skin by use of ordinary masking or wrapping tape. Should irritation persist, seek medical attention.

First Aid: Ingestion

Rinse mouth with water to remove dust and fibers and drink plenty of water to help reduce irritation. If irritation persists, seek medical attention.

First Aid: Eyes

Do not rub or scratch eyes. Dust particles may cause the eye to be scratched. Flush eyes with large amounts of water until irritation subsides. If irritation persists, seek medical attention.

First Aid: Ears

Wash exposed skin with soap and water. If irritation develops in the inner ear, seek medical attention.

First Aid: Notes to Physician

Dust from the product may cause mechanical irritation of the eyes, skin, and upper respiratory tract. Treat symptomatically.

Section 5 - Fire Fighting Measures

Flash Point: Not applicable

Upper Flammable Limit (UFL): Not applicable

Auto Ignition: Not determined

Rate of Burning: Not determined

General Fire Hazards

There is no potential for spontaneous fire or explosion. Inorganic glass fibers are naturally non-combustible and non-flammable.

Extinguishing Media

Carbon dioxide (CO₂), water, water fog, dry chemical.

Fire Fighting Equipment/Instructions

No special procedures are expected to be necessary for this product. Normal fire fighting procedures should be followed to avoid inhalation of smoke and gases.

Method Used: Not applicable

Lower Flammable Limit (LFL): Not applicable

Flammability Classification: Not determined

Section 6 - Accidental Release Measures

Clean-Up Procedures

Pick up large pieces. Vacuum dusts. If sweeping is necessary, use a dust suppressant such as water. Do not dry sweep dust accumulation. These procedures will help to minimize potential exposures.

Section 7 - Handling and Storage

Handling Procedures

Use protective equipment as described in Section 8 of this safety data sheet when handling uncontained material. Handle in accordance with good industrial hygiene and safety practices.

Storage Procedures

Warehouse storage should be in accordance with package directions, if any. Material should be kept clean, dry, and in original packaging.

Section 8 - Exposure Controls / Personal Protection

The Occupational Safety and Health Administration (OSHA) has not adopted specific occupational exposure standards for fiber glass. Fiber glass is treated as a nuisance dust and is regulated by OSHA as a particulate not otherwise regulated (total dust) shown in CFR 1910.1000 Table Z-3.

Respirable fraction 5 mg/m³

Total dust 15 mg/m³

JM has adopted the fiber glass industry voluntary Product Stewardship Program (PSP), formerly the NAIMA-OSHA Health and Safety Partnership Program (HSPP). Under the PSP, JM recommends that exposures be limited to the voluntary concentration of 1 f/cc TWA for fibers longer than 5 microns with a diameter less than 3 microns. This will help minimize potential irritation effects. The PSP also includes the PPE recommendations described below.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Safety glasses with side shields are recommended to keep dust out of the eyes.

Personal Protective Equipment: Ears

Use ear protection (earplugs, hood, or earmuffs) to prevent airborne dust or fibers from entering the ear, if necessary.

Personal Protective Equipment: Skin

Leather or cotton gloves should be worn to protect against mechanical abrasion. See also Personal Protective Equipment: General, below.

Personal Protective Equipment: Respiratory

A respirator should be used if ventilation is unavailable, or is inadequate for keeping dust and fiber levels below the applicable exposure limits referenced in Section 8 of this SDS. Wear a NIOSH-certified disposable or reusable particulate respirator with an efficiency rating of N95 or higher (per 42 CFR 84) when dust or fiber concentrations exceed the applicable exposure limits. Operations such as sawing, blowing, tear out, and spraying may generate airborne fiber concentrations requiring a higher level of respiratory protection. For exposures up to 50 times the established exposure limits use a full-face respirator, rated N99 or higher.

Ventilation

In fixed manufacturing settings, local exhaust ventilation should be provided at areas of cutting, milling or other processing to remove airborne dust and fibers.

Personal Protective Equipment: General

Wear a cap, a loose-fitting, long-sleeved shirt and long pants to protect skin from irritation. Exposed skin areas should be washed with soap and water after handling or working with fiber glass. Clothing should be washed separately from other clothes, and the washer should be rinsed thoroughly (run empty for a complete wash cycle). This will reduce the chances of fiber glass being transferred to other clothing.

Section 9 - Physical & Chemical Properties

| | | | |
|-------------------------------------|---|--------------------------|---------------------|
| Appearance: | White fibrous glass board, batt, blanket, or loose fiber, with or without various facings | Odor: | No significant odor |
| Physical State: | Solid | pH: | Not applicable |
| Vapor Pressure: | Not applicable | Vapor Density: | Not applicable |
| Boiling Point: | Not applicable | Melting Point: | >704°C/1300°F |
| Solubility (H₂O): | Nil | Specific Gravity: | Variable |
| Freezing Point: | Not applicable | Evaporation Rate: | Not applicable |
| Percent Volatile: | 0 | VOC: | Not determined |

Section 10 - Stability & Reactivity Information

Stability

These products are not reactive.

Hazardous Decomposition

May form carbon dioxide and carbon monoxide.

Hazardous Polymerization

Will not occur.

Section 11 - Toxicological Information

Acute Toxicity

A: General Product Information

Dust from this product is a mechanical irritant, which means that it may cause temporary irritation or scratchiness of the throat, and/or itching of the eyes and skin.

B: Component Analysis - LD50/LC50

No LD50/LC50's are available for this product's components.

Component Carcinogenicity

Fiber glass wool

- ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans
NTP: Reasonably Anticipated To Be A Carcinogen (respirable size)
IARC: Group 3 - Not Classifiable (IARC Monograph 81 [2002] (listed under Man-made mineral fibres),
Monograph 43 [1988])

Chronic Toxicity

The U.S. Department of Health and Human Services, National Toxicology Program (NTP 1998, 2000, 2002) classified glass wool (respirable size) as reasonably anticipated to be a human carcinogen, based on sufficient evidence of carcinogenicity in animals. This assessment was originally prepared in 1993-1994 for the 7th Report on Carcinogens (NTP 1994), but has not been updated since then in the 8th, 9th, or 10th Reports on Carcinogens (NTP 1998, 2000, 2002).

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

No data available for this product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions

A: General Product Information

This product is not expected to be a hazardous waste when it is disposed of according to the U.S. Environmental Protection Agency (EPA) under Resource Conservation and Recovery Act (RCRA) regulations. Product characterization after use is recommended to ensure proper disposal under federal and/or state requirements.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

Section 14 - Transport Information

International Transport Regulations

These products are not classified as dangerous goods according to international transport regulations.

Section 15 - Regulatory Information

US Federal Regulations

A: General Product Information

SARA 311/312: This product is not classified as hazardous under SARA 311/312.

B: Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

State Regulations

A: General Product Information

The glass fibers in this product are not known to be regulated.
Other state regulations may apply. Check individual state requirements.

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.

| Component | CAS # |
|------------------|----------------|
| Fiber glass wool | Not Applicable |

TSCA Status

This product and its components are listed on the TSCA 8(b) inventory.

None of the components listed in this product are listed on the TSCA Export Notification 12(b) list.

International Regulations

A: General Product Information

These products are considered articles under both U.S. and international product regulations and as such, these products do not require registration or notification on the various country-specific inventories.

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

| Component | CAS # | Minimum Concentration |
|------------------|----------------|--------------------------------|
| Fiber glass wool | Not Applicable | 1 % (related to Fibrous glass) |

WHMIS Classification

Controlled Product Classification: D2A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations. This SDS contains all the information required by the Controlled Products Regulations.

Section 16 - Other Information

Other Information

Prepared for:
Johns Manville
Insulation Systems
P. O. Box 5108
Denver, CO USA 80217-5108

Prepared by:
Johns Manville Technical Center
P.O. Box 625005
Littleton, CO USA 80162-5005

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

| Date | MSDS # | Reason |
|----------|-------------|---|
| 03/22/05 | 1071-1.0000 | New MSDS for antimony free BI products. |
| 06/06/05 | 1071-1.0001 | Addition of Unfaced Sound Control Batts to Sect. 1 trade names. |
| 06/29/06 | 1071-1.0002 | Removed Insul-SHIELD® Unfaced Boards, Formaldehyde-free from trade names. |
| 07/16/07 | 1071-1.0003 | Regulatory update. Minor edits. |
| 02/29/08 | 1071-1.0004 | Removed Spin-Glas®; Steel Frame Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation from trade names. Added 'Antimony Trioxide-free' to material name. Edited WHMIS classification to D2A for fiber glass wool. |
| 03/03/09 | 1071-1.0005 | Addition of Pour and Rake Attic Insulation to trade names. |
| 06/02/09 | 1071-1.0006 | Addition of FlexGlas PC to trade names. |

End of Sheet 1071

ICYNENE INSULATION

[RELATED SECTION 07 21 19]

Model Number: MD-R-200

Location: Main House and Flex OM floor and roof, northeast corner of the Bay Window, south wall of the Core Module

Features:

Thermal resistance: $R/in = R5.2 \text{ hr. ft}^2 \text{ }^\circ\text{F}/\text{BTU}$

Water vapor transmission properties: 1.3 Perms @ 3"

Surface burning characteristics @ 2" thickness: flame spread of ≤ 25 and smoke development of ≤ 450

Water absorption: 0.57% by Volume

Available: Home Energy Partners



PRODUCT SPECIFICATION

1. PRODUCT NAME

ICYNENE MD-R-200™

ICYNENE MD-R-200™ is a trademark for medium density, 100% water-blown polyurethane spray foam manufactured by Icynene. ICYNENE MD-R-200™ is a nominal 2 lbs/ft³ density, free rise material.

2. MANUFACTURER

ICYNENE MD-R-200™ is made on-site from liquid components manufactured by Icynene Inc. Installation and on-site manufacturing are supplied by Independent Icynene Licensed Dealers.

3. PRODUCT DESCRIPTION

Icynene's next generation of high performance products includes ICYNENE MD-R-200™, a 100 % water-blown foam insulation and air barrier material containing resins with pre- and post-consumer recycled content. This unique product is a tough, low water absorption product with applicability across a broad range of substrates, environmental conditions and climate zones.

It is a type III vapor retarder, with low vapor permeance. It can be used to limit diffusion of moisture through building assemblies.

ICYNENE MD-R-200™ insulates and air-seals in one step for maximum energy conservation while minimizing the environmental impact during manufacturing and construction. Significantly reducing air leakage means ICYNENE MD-R-200™ contributes to a healthier, quieter and more comfortable indoor environment, while reducing energy consumption and related greenhouse gas emissions by as much as 50%.

The result is superior quality construction, with higher comfort levels and lower heating and/or cooling costs. Energy savings will vary depending on building design, location, etc.

ICYNENE MD-R-200™ is applied by spraying liquid components onto an open wall, crawlspace, ceiling surface or cathedral ceiling. There it expands approximately 30:1 in seconds to provide a foam blanket of millions of tiny air cells, filling building cavities, cracks and crevices in the process. It adheres to most construction materials, sealing out air infiltration.

Excess material is trimmed off, leaving a surface ready for drywall or other code-compliant finish.

4. TECHNICAL DATA

(Based on Core Samples)

Contains Recycled Content

Thermal Performance

Thermal resistance (ASTM C518)

- R/In = R5.2 hr. ft² °F/BTU

Average insulation contribution in a stud wall:

- 2" x 4" = R16 (3" foam)

- 2" x 6" = R26 (5" foam)

ICYNENE MD-R-200™ provides more effective performance than the equivalent R-value of air permeable insulation materials. ICYNENE MD-R-200™ is not subject to loss of R-value due to aging, windy conditions, settling, convection or air infiltration; nor is it prone to traditional moisture intrusion via convective air flow.

A FACT SHEET with R-value data is available upon request.

Air Permeance/Air Barrier /Air-Seal

ICYNENE MD-R-200™ fills any shaped cavity, and adheres to most construction materials, creating assemblies with very low air permeance. Additional interior or exterior air infiltration protection is subject to applicable codes.

Air permeability of core foam:

ASTM E283 data:

- 0.0016 L/s·m² @ 75 Pa for 2".

ASTM E2178 data

- 0.0015 L/s·m² @ 75 Pa for 2".

All buildings, insulated and air-sealed with ICYNENE MD-R-200™ must be designed to include adequate mechanical ventilation/outdoor air supply. See ASHRAE Standard 62 – Ventilation for Acceptable Indoor Air Quality.

Water Vapor Permeance

ICYNENE MD-R-200™ is a type III vapor retarder with low water vapor permeability reducing the amount of moisture that can

diffuse through the insulation. Water vapor transmission properties: (ASTM E96 Desiccant Method)

- 1.3 Perms @ 3"

Water Absorption Properties

The absorption of liquid water is very low.

Water Absorption, % by volume

- ASTM D2842: 0.57%

Burn Characteristics

ICYNENE MD-R-200™ is a combustible product and is therefore, consumed by flame, but will not sustain flame upon removal of the flame source. It leaves a charred foam residue. It will not melt or drip. ICYNENE MD-R-200™ is subject to all National/State and County building codes regarding fire prevention. Requirements for Thermal Barrier and Ignition Barrier coverings must be met as per the applicable building code having jurisdiction.

U.S. Fire Testing

Surface Burning Characteristics (ASTM E84) @ 2" thickness

Flame Spread ≤25

Smoke Development ≤450

*Flame spread rating not intended to reflect hazards under actual fire conditions.

Plastic Piping

ICYNENE MD-R-200™ is compatible in direct contact with CPVC piping systems, as per Paschal Engineering Study for the Spray Polyurethane Foam Alliance.

Bacterial or Fungal Growth and Food Value

Independent testing conducted as per ASTM C1338 showed that ICYNENE MD-R-200™ is not a source of food for mold; and as an air barrier material, ICYNENE MD-R-200™ restricts the airborne introduction of moisture, nutrients, and mold spores into the building envelope.

Environmental / Health / Safety

ICYNENE MD-R-200™ is 100% water-blown and therefore contains no ozone-depleting blowing agents. It is also PBDE-free.

Proper handling and use is required to avoid exposure to reactive chemicals in their unreacted state. For more information, contact Spray Polyurethane Foam Alliance or the American Chemistry Council. Newly Insulated areas have been shown to be safe for occupancy 24 hours after installation is complete.

ICYNENE MD-R-200™ is CHPS E.Q. 2.2/Section 01350 Compliant and listed as such in the Collaborative for High Performance Schools (CHPS) Low Emitting Materials (LEM) Table. Under LEED guidelines, products that are CHPS E.Q. 2.2/Section 01350 Compliant are considered Environmentally Preferable Products.

The reaction used to create ICYNENE MD-R-200™ generates Carbon Dioxide to expand the foam. Carbon Dioxide has a very low Global Warming Potential (GWP of 1).

Not to be installed within 3" of heat emitting devices or where the temperature is in excess of 180°F, in accordance with applicable codes.

5. INSTALLATION

ICYNENE MD-R-200™ is installed by a network of Licensed Dealers, trained in the installation of ICYNENE MD-R-200™.

Installation is generally independent of environmental conditions. ICYNENE MD-R-200™ can be installed in hot, humid or freezing conditions. Surface preparation is generally not necessary. Within seconds, the foaming process is complete.

For information on Health and Safety, refer to the Spray Polyurethane Foam Alliance Health and Safety guidance documents at www.spraypolyurethane.com

6. AVAILABILITY

Check regional Yellow Pages™ or contact Icynene Inc. at 800-758-7325 or visit our website at www.Icynene.com for a local Icynene Licensed Dealer.

7. WARRANTY

WHEN INSTALLED PROPERLY IN ACCORDANCE WITH INSTRUCTIONS, THE COMPANY WARRANTS THAT THE PROPERTIES OF THE PRODUCT MEET PRODUCT SPECIFICATIONS AS OUTLINED IN THIS PRODUCT SPECIFICATION SHEET. SAVE AND EXCEPT ANY EXCLUSIONS REFERENCED IN THE WARRANTY.

8. TECHNICAL

Icynene Licensed Dealers and Icynene Inc. provide support on both technical and regulatory issues. Architectural specifications in CSI 3-Part format and design details are available upon request.

9. REGULATORY

ICYNENE MD-R-200™ has been tested as per the requirements of the International Code Council – Evaluation Service’s AC308 Acceptance Criteria (June 2009).

The following Evaluation Service report applies to this product:

- ICC ESR – 3005

Based on the evidence submitted, this product was found to comply with:

- IRC – 2006
- IBC – 2006
- IECC – 2006

when installed in suitable thicknesses and assemblies listed in the ESR report.

For regulatory issues concerning ICYNENE MD-R-200™, contact Icynene Inc. at 800.758.7325.

10. RELATED REFERENCES

All physical properties were determined through testing by accredited third party agencies.

Icynene Inc. reserves the right to change specifications in its effort of continuous improvement. Please confirm that technical data literature is current.

11. PACKAGING AND STORAGE

| | |
|---------------|----------------------------|
| Packaging | 55 U.S. gallon steel drums |
| Component ‘A’ | 550 lb. per drum |
| | Base Seal® MDI |
| Component ‘B’ | 500 lb. per drum |
| | ICYNENE MD-R-200™ Resin |

Storage

Component A, Base Seal® MDI and Component B, ICYNENE MD-R-200™ Resin ideally should be stored between 60°F and 90°F and never exceed 100°F.

Component A, Base Seal® should be protected from freezing.

Component B, ICYNENE MD-R-200™ Resin must be mixed prior to use.

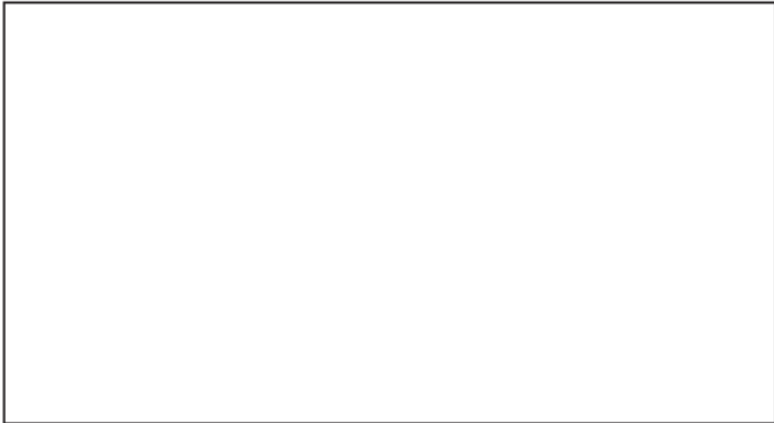
12. INSTALLATION SPECIFICATIONS

Must be installed by Icynene Licensed Dealers. Refer to the ICYNENE MD-R-200™ Technical Data Sheet.



ICYNENE®

Telephone: 905.363.4040
 Toll Free: 800.758.7325
 Facsimile: 905.363.0102
 Website: www.Icynene.com
 E-mail: inquiry@Icynene.com





6747 Campobello Rd., Mississauga, Ontario, L5N 2L7, Canada
Tel: 905.363.4040 Toll Free: 800.758.7325 Fax: 905.363.0102

MATERIAL SAFETY DATA SHEET

Product Name: ICYNENE MD-R-200™

Section 1: Chemical, Product and Company Information

Product Name: ICYNENE MD-R-200™
ICYNENE MD-R-200™ is a trademark of Icynene Inc.

Product Use: SPRAY-ON CELLULAR PLASTIC INSULATION

Product Code: Not Applicable

Revision Date: July 28, 2009

Section 2: Ingredient Information

| <u>Ingredients (% w/v, unless otherwise noted)</u> | <u>Cas No:</u> | <u>Wt. %:</u> |
|--|------------------|----------------|
| (BASE SEAL [®]), Component A | CAS# 009016-87-9 | 50 % by volume |
| (ICYNENE MD-R-200™), Resin Component B | | 50 % by volume |

NOTE: Does not contain any ozone destroying or global warming refrigerants such as CFC's, HCFC's, or HFA's.

Section 3: PHYSICAL DATA

Appearance: Semi-rigid platinum coloured cellular foam of "angel food cake" consistency and appearance

Solubility In Water: Insoluble.

Density: 2.0 lbs./cubic foot

Odour: None

Emissions: Safe for occupancy after 24 hrs, no emissions detectable after 30 days.

Section 4: FIRE & EXPLOSION HAZARD DATA

Flammability: Combustion occurs at 400°F (material will not sustain combustion on its own)

Flame Spread: Less than 20

Smoke Developed: Less than 400

Method Used: ASTM E84

Melting: Does not melt

Flammable Limits: LFL: - not determined
UFL: - not determined

Extinguishing Media: Water, carbon dioxide, dry chemical or foam.

MATERIAL SAFETY DATA SHEET

Product Name: ICYNENE MD-R-200™

Fire & Explosion Hazards: Prevent breathing of combustion fumes (smoke)

Fire Fighting Equipment: Firefighters must wear a self-contained breathing apparatus to avoid breathing smoke generated by combustion.

Section 5: REACTIVITY DATA

Stability: Stable under all normal conditions

Incompatibility: Compatible with all products

Section 6: ENVIRONMENTAL & DISPOSAL INFORMATION

Disposal Method: Follow all federal, provincial, state and local regulations.

Section 7: HEALTH HAZARD DATA

Detectable Emissions: No detectable emissions

Systemic & Other Effects: Not available

Ingestion: The consequences of ingestion of large amounts are unknown

Dust Inhalation: May cause mechanical irritation to the respiratory system

Eye Protection: Use glasses when cutting foam

Skin Protection: Dust from foam cutting may cause irritation

Section 8: FIRST AID

Ingestion: Medical advice should be obtained

Inhalation: Remove to fresh air, consult a physician

Eye Contact: Flush with water to remove particles

Skin Contact: No special precautions required

Section 9: ADDITIONAL INFORMATION

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY EXPRESS OR IMPLIED, IS MADE. CONTACT ICYNENE INC. FOR FURTHER INFORMATION.

Section 10: PREPARATION INFORMATION:

Prepared by: D.Thom

Title: R&D Manager

Telephone: 1-800-758-7325

Date of Preparation: July 28, 2009

VAPROSHIELD WALLSHIELD WATER-RESISTIVE BARRIER**[RELATED SECTION 07 25 00]**

Model Number: 10309000

Location: east wall of OM Closets

Dimensions:

Length: 59" [1.5 m]

Width: 164' [50 m]

Weight: 34lbs [12 kg]

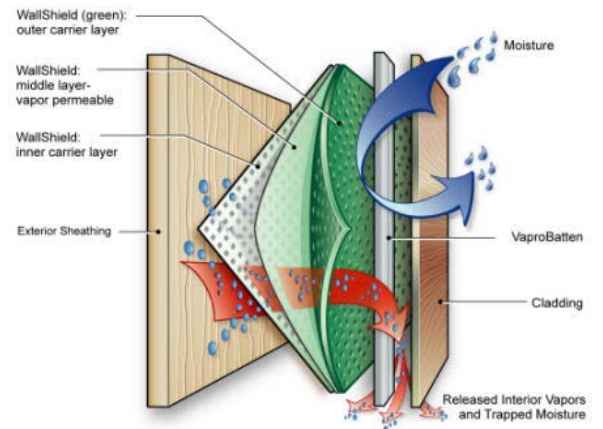
Color: black

Features:

Water vapor transmission: 212 perms

Triple layer spun bond polypropylene

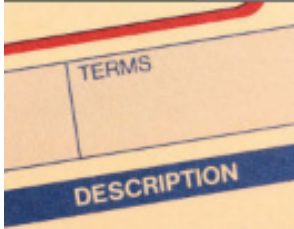
Available: Premier Building Products



VaproShield High Performance Building Envelope Solutions

- Knowledge & Research
- Continuing Education
- Rain Screen Design
- Product Comparison
- About Us
- Environmental
- LEED
- News

| | | | | | |
|-------------|------------------|----------|----------------|---------|--------------|
| VaproShield | Project Profiles | Products | Specifications | Details | Installation |
|-------------|------------------|----------|----------------|---------|--------------|



How to Buy

Thank you for your interest in VaproShield products and solutions. To order membranes and products from VaproShield you have three convenient options noted below.

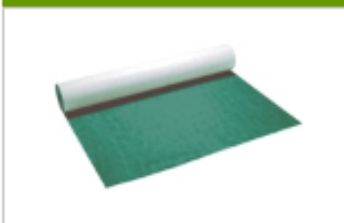


Thank you for your interest in VaproShield products and solutions. To order membranes and products from VaproShield you have three convenient options:

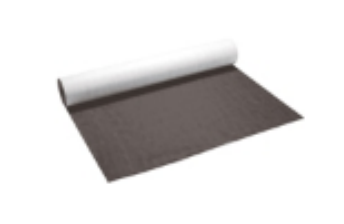
1. Contact us toll free 1-866-731-7663
2. Email us orders@vaprosshield.com
3. Contact a VaproShield Representative in your area

Pre-sales, product technical support and pricing inquiries call: 1-866-731-7663 or [Contact Us](#)

BREATHABLE MEMBRANES



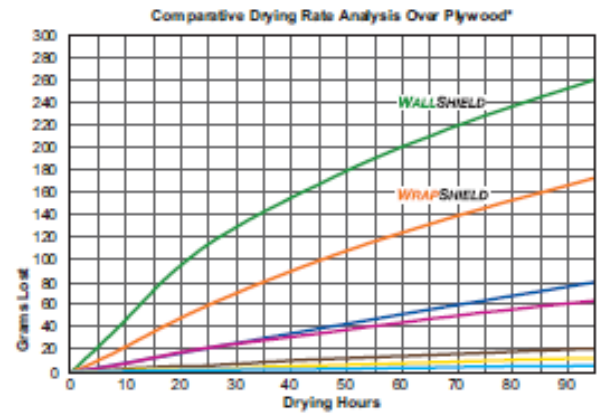
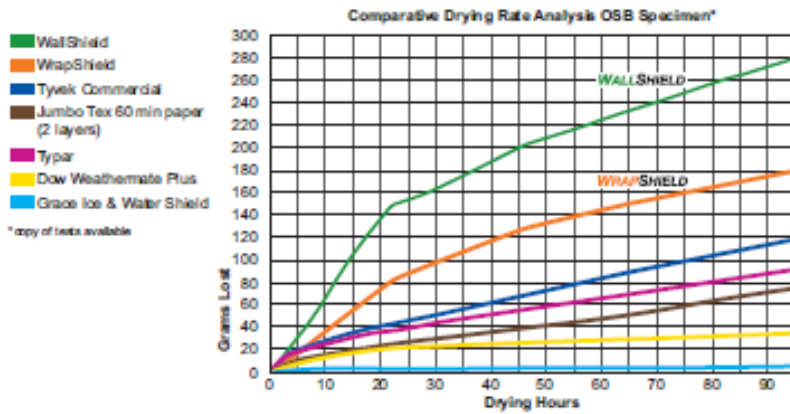
Wall Shield® Roll
Part No. 10200000 - Roll Size: 59"x164" (1.5m x 50m) (807 S/F)
Roll Weight: 34 lbs (12kg)
Color: Green (top) White (back)
Skid: 23 Rolls



Wall Shield® Roll - BLACK
Part No. 10300000 - Roll Size: 59"x164" (1.5m x 50m) (807 S/F)
Color: Black (top) White (back)
Roll Weight: 34 lbs (12kg)
Skid: 23 Rolls

Third Party Testing Drying Rates Comparisons

Actual test reports available from VaproShield LLC



The superior drying capability of WallShield, the highest vapor permeable commercial breather membrane in the industry

WALLSHIELD TESTING

Acceptance Criteria for Weather Resistive Barriers AC 38 (polymeric-based barriers). Test reports available from VaproShield LLC.

| Property | Standard/Test | Result |
|--|--|--|
| Tensile Strength | ASTM D882 | MD – 28.2 lbf/inch (4.94 N/mm) CD – 22.6 lbf/inch PASS |
| Water Resistance (control and weathered specimens) | AATCC 127 (55cm Hydrostatic Head of Water for 5 hrs) | No leakage noted on underside of control or weathered samples PASS |
| Water Vapor Transmission | ASTM E96* (Method B) | 1309.7 g/m ² 24hrs 12126.4 ng/Pa/s/m ² 212 Perms PASS |
| Flamespread Index | ASTM E-84 | 5 – Class A PASS |
| Smoke Development Index | ASTM E-84 | 70 – Class A PASS |

VaproShield breathable membranes are unsurpassed in their ability to dry wet sheathing

Third-party testing results clearly indicate the superior drying capability of both WallShield and WrapShield.

Drying is essential in preventing the damaging effects of mold, mildew and rot resulting in repair costs, poor indoor air quality and strain on HVAC systems.

Tested in accordance with ICC-ES AC 38 criteria to meet IBC and IRC requirements for Weather Resistive Barriers (ICC Certificate #ESR-1916).

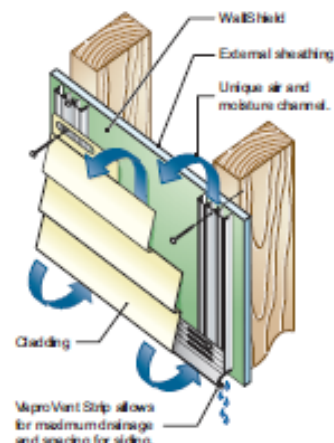
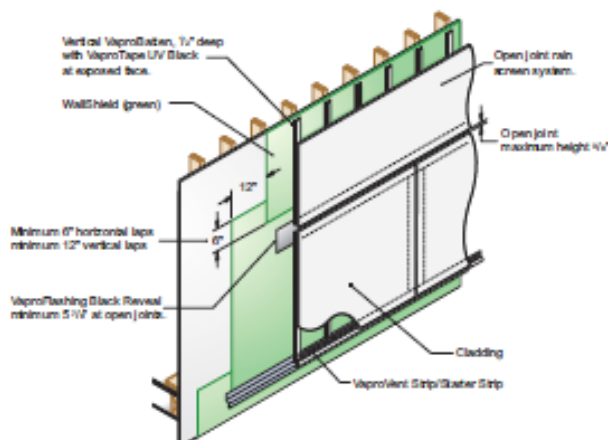
*ASTM E 96 -Method B (wet cup method) typically gives a more realistic result for permeance for highly permeable products than does the Method A (dry cup/desiccant method).

OPEN JOINT RAIN SCREEN DESIGN APPLICATION

WallShield with Open Joint Rain Screen Design Components and VaproFlashing (black) for desired reveal effect

RAIN SCREEN DESIGN

WallShield with Rain Screen Design Components: VaproBatten and VaproVent Strip



Provided by: VAPROSHIELD, LLC
915 26TH Ave. NW, #C-5
Gig Harbor, WA 9335
866-731-7663

This form is designed to meet the requirements of the U.S. Labor Department OSHA form no 174.

SECTION I – PRODUCT IDENTIFICATION

Product: WallShield®
Emergency Assistance: 866-731-7663

Chemical Name: N/A
Chemical Family: Polypropylene
Formula: N/A

SECTION II – HAZARDOUS COMPONENTS

NONE

SECTION III – PHYSICAL DATA

Boiling Point Range: N/A
Vapor Pressure: N/A
Vapor Density: N/A
Solubility in Water: Insoluble
Appearance and Odor: Numerous Colors/No odor

Specific Gravity: N/A
Melting Point Range: 329 to 338 degrees Fahrenheit
Evaporation Rate: N/A

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Ignition Temperature: 662 degrees Fahrenheit
Flammable Limits: N/A
Extinguishing Media: Carbon dioxide, dry chemical, foam, water fog, and water spray
Special Fire Fighting Procedures: Use water spray to cool fire exposed surfaces and to protect personnel.
Unusual Fire and Explosion Hazards: None

SECTION V – REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Overheating
Incompatibility (Material to Avoid): Avoid contact with strong oxidizing agents
Hazardous Decomposition Products: None
Hazardous Polymerization: N/A

SECTION VI – HEALTH HAZARD DATA

Primary Routes of Entry:

- **Eyes:** None
- **Ingestion:** Not a normal exposure
- **Inhalation :** None
- **Skin:** None

Permissible Exposure Level: N/A

Chemicals contained herein listed as carcinogens or potential carcinogens:

NTP: NONE IARC: NONE OSHA: NONE

Effects of Overexposure:

- Eyes: N/A
- Ingestion: Acute oral LD50 is greater than 2000mg/Kg
- Inhalation: N/A
- Skin: N/A.

Medical Conditions generally aggravated by exposure: N/A

Emergency and First Aid Procedures:

- Eyes: Flush with water.
- Ingestion: Contact a physician
- Inhalation: N/A
- Skin: Remove with waterless hand cleaner. Wash with soap and water

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled: N/A

Waste disposal method: Dispose of in accordance with Federal, State and local regulations.

Precautions to be taken in handling and storing: Do not store near flame, heat or strong oxidizing agents.

SECTION VIII – CONTROL MEASURES

Respiratory Protection: N/A

Eye Protection: Chemical goggles

Ventilation: N/A

Protective Gloves: N/A

SECTION X - NOTES

Note: N/A = not applicable

Date Prepared: May 5, 2004

Information herein is given in good faith and is, to the best of our knowledge and belief, accurate and reliable. However, since information herein was obtained, in part, from independent suppliers not under the direction and supervision of VAPROSHIELD. VAPROSHIELD makes no warranty or representation, express or implied that information is accurate, reliable, complete or representative. VAPROSHIELD warrants only that it has made no effort to censor other than trade secret information or to conceal deleterious aspects of its products. The data shown above in no way modifies, amends, or enlarges any specifications or warranty.

All components of this product are listed in the EPA/TSCA Inventory or Chemical Substances.

VAPROTAPE UV BLACK

[RELATED SECTION 07 25 00]

Model Number: 60304500

Location: east wall of OM Closets

Dimensions [L x W]:

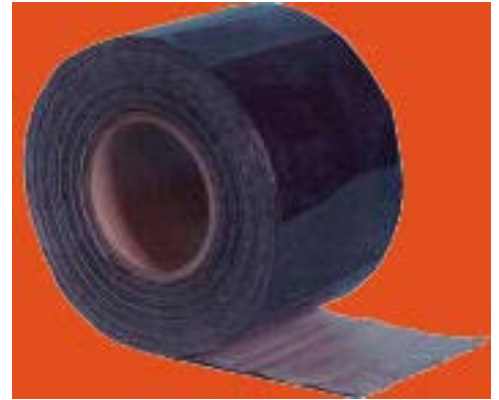
Length: 50'

Width: 4"

Weight: 4 lbs

Color: Black

Available: Premier Building Products





VaproShield High Performance
Building Envelope Solutions

- Knowledge & Research
- Continuing Education
- Rain Screen Design
- Product Comparison
- About Us
- Environmental
- LEED

TAPE/ADHESIVES



VaproAluma™ 4" Tape

Part No. 60804500 - Roll Size: 4"x 50' (102mm x15.24m)
Roll Weight: 4lb (1.8 kg)
Color: Silver Foil
Case: 6 Rolls



VaproAluma™ 5" Tape

Part No. 60805300 - Roll Size: 5"x 50' (229mm x15.24m)
Roll Weight: 9lb (4.1 kg)
Color: Silver Foil
Case: 2 Rolls



VaproTape™ Double-Sided

Part No. 60801500 - Roll Size: 1"x 50' (25mm x15.24m)
Roll Weight: .75 lb (0.34 kg)
Color: Gray
Case: 24 Rolls



VaproTape™ Single-Sided

Part No. 60802500 - Roll Size 2"x 50' (51mm x 15.24m)
Part No. 60803500 - Roll Size: 3"x 50' (76mm x15.24m)
Roll Weight: 1.75 lbs (.79 kg)
Color: Gray
Case: 8 Rolls



VaproTape™ UV Black

Part No. 60304500 - Roll Size: 4"x 50' (102mm x15.24m)
Roll Weight: 4.16 lbs (1.89 kg)
Color: Black
Case: 6 Rolls

Provided by: **VAPROSHIELD, LLC**
915 26TH Ave. NW, #C-5
Gig Harbor, WA 9335
866-731-7663

This form is designed to meet the requirements of the U.S. Labor Department OSHA form no 174.

SECTION I – PRODUCT IDENTIFICATION

Product: **1" VaproTape (Double-Stick)***
24 Hour Emergency Assistance – (847) 540-0600

Chemical Name: N/A
Chemical Family: Polyolefin and Synthetic Elastomer
Formula: N/A

HMIS/NFPA HAZARD RATINGS:

| | |
|---------------------|---|
| Health Hazard: | 0 |
| Flammability Hazard | 1 |
| Reactivity Hazard | 0 |

SECTION II – HAZARDOUS COMPONENTS

NONE

SECTION III – PHYSICAL DATA

| | |
|--|---|
| Boiling Point Range: 420 Degrees Fahrenheit | Percent Volatile by Weight: N/A |
| Vapor Pressure: N/A | Evaporation Rate: N/A |
| Vapor Density: N/A | Appearance and Odor: Black and white tapes or gray sealant |
| Solubility in Water: Insoluble | |
| Specific Gravity: 1.04 (adhesive) | |

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Point and Method: 450 Degrees Fahrenheit COC
Flammable Limits: N/A
Extinguishing Media: Carbon dioxide, dry chemical, foam, water fog, and water spray
Special Fire Fighting Procedures: Use water spray to cool fire exposed surfaces and to protect personnel.
Unusual Fire and Explosion Hazards: None

SECTION V – HEALTH HAZARD DATA

Permissible Exposure Level: N/A
Effects of Overexposure:

- **Eyes:** N/A
- **Ingestion:** Acute oral LD50 is greater than 10g/kg
- **Inhalation:** N/A
- **Skin:** N/A.

Emergency and First Aid Procedures:

- **Eyes:** Flush with water.
- **Ingestion:** Contact a physician

- **Inhalation:** N/A
- **Skin:** Remove with waterless hand cleaner. Wash with soap and water

Medical Conditions generally aggravated by exposure: N/A

Primary Routes of Entry:

- **Eyes:** None
- **Ingestion:** Not a normal exposure
- **Inhalation :** None
- **Skin:** None

Chemicals contained herein listed as carcinogens or potential carcinogens:

NTP: NONE **IARC:** NONE **OSHA:** NONE

SECTION VI – REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Overheating

Incompatibility (Material to Avoid): Avoid contact with strong oxidizing agents

Hazardous Decomposition Products: None

Hazardous Polymerization: Will not occur.

SECTION VII – SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled: Sweep up

Waste disposal method: Dispose of in accordance with Federal, State and local regulations.

SECTION VIII – SPECIAL PROTECTION INFORMATION

Respiratory Protection: N/A

Eye Protection: Chemical goggles

Ventilation: N/A

Protective Gloves: N/A

SECTION IX – SPECIAL PRECAUTIONS

Precautions to be taken in handling and storing: Do not store near flame, heat or strong oxidizing agents.

SECTION X - NOTES

Note: N/A = not applicable

NE = not established

Issue Date: August 5, 1991

Issued By: John Bilstein (KK)

Revision Date: June 20, 1996

Review Date: April 19, 1999

Information herein is given in good faith and is, to the best of our knowledge and belief, accurate and reliable. However, since information herein was obtained, in part, from independent suppliers not under the direction and supervision of VAPROSHIELD. VAPROSHIELD makes no warranty or representation, express or implied, that information is accurate, reliable, complete or representative. VAPROSHIELD warrants only that it has made no effort to censor other than trade secret information or to conceal deleterious aspects of its products. The data shown above in no way modifies, amends, or enlarges any specifications or warranty.

All components of this product are listed in the EPA/TSCA Inventory or Chemical Substances.

VERTICAL CEDAR SIDING

[RELATED SECTION 07 46 23]

Location: exterior of Main House

Dimensions:

Width: 8"

Depth: 1"

Finish: Mark Twain Gray Brick

Features:

Channel rustic milled 8" cedar siding with 6" exposure attached to furring strips

Species: Western Red Cedar

Product pattern: Channel Siding

Grade: Select Knotty

Grading agency paragraph: NLGA para. 204a

Moisture content: Kiln-dried

Surface to be exposed: Sawn Face

Available: Lowes

Price: \$25.87





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1 x 8 x 12 Cedar Board

Item #: 7506 | Model #:38158

★★★★★ Be the first to write a review!

\$25.87

Image displayed is not an image of the actual product. Please review the product description for specific details

Customize Your Order

- [Pick Up In Store at Lowe's Of Boone, NC - FREE](#)
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- [Lowe's Truck Delivery](#)

Parcel Shipping Not Available

1 x 8 x 12 Cedar Board \$25.87

Subtotal: \$25.87

Qty.:

[Add to Cart](#)

[Delivery Rate Estimate](#)

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[🕒 Set a Reminder](#)

[Go to Your Account](#)

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Top Choice 2 x 4 x 8 #2 Prime Treated Lumber
★★★★★
\$3.40

Top Choice 2 x 4 x 8 S4S Cedar Decking
★★★★★
\$7.77

Customers Also Viewed

- x 8 x 8 Cedar Board**
Not Yet Rated
\$12.94
- x 6 x 8 Cedar Board**
Not Yet Rated
\$9.98
- x 6 x 12 Cedar Board**
Not Yet Rated
\$20.36
- x 6 x 8 Cedar Tongue & Groove Board**
★★★★★
\$13.98
- x 4 x 8 Cedar Board**
Not Yet Rated
\$4.91

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|----------------------------|-------------------------------------|---------------------------|------|
| Size | 1 x 8 | Nominal Width (Inches) | 8 |
| Dressing | S1S2E (Surfaced one side two edges) | Nominal Length (Feet) | 12 |
| | | Actual Thickness (Inches) | 0.75 |
| | | Actual Width (Inches) | 7.5 |
| Green or Kiln-Dried | Kiln-dried | Actual Length (Inches) | 144 |
| Species | Western Red Cedar | | |
| Grade | Select/Clear | | |
| Nominal Thickness (Inches) | 1 | | |

HIGHLAND CRAFTSMEN BARK HOUSE PIONEER SHINGLE

[RELATED SECTION 07 46.23.13]

Location: Flex OM, exterior of Main House south wall

Dimensions:

Length: 26"

Width: 6" minimum to 4' maximum [average 13" and wider]

Depth: 1/2" minimum to 7/8" maximum

Finish: yellow poplar

Features:

Moisture content: approximately 6-8% guaranteed Kiln Dried & Heat Sterilized

Squared: re-squared to exact 90 degree edges for precise installation

Appearance graded for performance and appearance. 100% usable sound bark. No open defect, no brown scaly bark.

Available: Highland Craftsmen, Inc.





Bark Specs

Bark House Shingle Specs

With Highland Craftsmen Bark House® Shingles, you always have options.

0 tweets
tweet

Bark House® Shingles come in three grades: Standard™ & Premium™ Grades for exterior use & Interior™ Grade for interior use

Standard™ Grade

Thickness:
1/2" minimum to 7/8" maximum



Widths:
6" minimum to 4" maximum (Average Shingle width is 13" and wider)

Lengths:
18" or 26" lengths & 36" x 36" panels available



Moisture Content:
Approximately 6-8% guaranteed Kiln Dried & Heat Sterilized

Appearance:
Graded for performance and appearance. 100% usable sound bark. No open defect, no brown scaly bark

Squared:
Re-Squared to exact 90 degree edges for precise installation



Contact Bark House!

Name *

Email Address *

Phone *

Submit

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Recent News:

William McDonough on Cradle to Cradle Certified Bark House Brand Shingles

Chris McCurry at Carolina Connect 2010

Rep. Frye and Sen. Queen Instrumental in New Jobs for Spruce Pine

Site Navigation

Home

About Highland Craftsmen

Bark House Values

Employee Programs

Meet The Experts

The Original

What They Say

Additional Information

G.M.C ROOF FELT

[RELATED SECTION 07 46 23.13]

Model Number: No. 30 Felt

Location: Main House, OM Closets, Flex OM

Dimensions:

Length: 72'

Width: 36"

Color: Black

Features:

Flat roof type: felt

Use: water proofing material

Available: Lowes

Price: \$17.00





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Home : [Search "no 34 felt"](#) : GMC Roof Felt 2 Sq. No. 30 Asphalt



GMC Roof Felt 2 Sq. No. 30 Asphalt

Item #: 10308 | Model #: NO. 30 FELT

★★★★★ [Be the first to write a review!](#)

\$17.00

Customers Also Viewed



250' x 4' Roofing Underlayment

★★★★★
\$102.00



Warrior Roofing Roof Felt 4 Sq. No. 15...

★★★★★
\$17.00



7/16 x 4 x 8 OSB Sheathing

★★★★★
\$6.50



CertainTeed 144' x 3' Black Roll Roofing

Not Yet Rated
\$38.00



36' x 3' Black Roll Roofing

★★★★★
\$33.70

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|--------------------------|-------------------------|----------------|--------|
| Flat Roof Type | Felt | Color / Finish | Black |
| Use / Purpose | Water Proofing material | Width (Feet) | 3.0 |
| Roof Specifications | 30lb | Length (Feet) | 72.0 |
| Coverage Area (Sq. Feet) | 216.0 | Color Family | Blacks |

FIRESTONE THERMOPLASTIC POLYOLEFIN MEMBRANE

[RELATED SECTION 07 54 23]

Model Number: UltraPly TPO

Location: Main House, OM Closets, Flex OM

Dimensions:

Length: 72'

Width: 36"

Depth: 0.045"

Color: white

Features:

0.060" over the reinforcing scrim[top-ply thickness]

Flat roof type: felt

Use: water proofing material

Elongation at reinforcement break: 25%

Tearing strength: 120 lb_f

Water absorption: less than 3%

Available: Firestone



Firestone BUILDING PRODUCTS

UltraPly™ TPO

DESCRIPTION:

Firestone UltraPly™ TPO is a flexible Thermoplastic Polyolefin roofing membrane that is produced with polyester weft-inserted reinforcement. This heat weldable TPO membrane is available in 45 mil (1.1 mm) and 60 mil (1.5 mm) thicknesses in 8' (2.4 m), 10' (3 m) and 12'4" (3.76 m) widths. The colors available are white, tan or gray. This reflective membrane is suitable for a variety of low slope applications.

METHOD OF APPLICATION:

1. Firestone UltraPly TPO membrane is installed as continuous roofing or waterproofing layer on the roof. Rolls are overlapped (side laps and end laps) prior to the heat welding of the seam areas.
2. Install the UltraPly TPO Roofing System in accordance with current Firestone UltraPly TPO specifications, details and workmanship requirements.
3. Please contact your Firestone Technical Coordinator at 1-800-428-4511 or visit the Firestone Technical Database for additional information at www.firestonebpco.com

PRODUCT DATA:

Thickness: 0.045" (1.1 mm)
0.060" (1.5 mm)
Width: 5 ft to 12 ft 4 in (1.5 m to 3.75 m)
Length: 100 ft (30.5 m)
Colors: White, Tan, Gray



**ENERGY STAR is only valid in the United States*

This sheet is meant to highlight Firestone's products and specifications and is subject to change without notice. Firestone takes responsibility for furnishing quality materials, which meet Firestone's published product specifications. Neither Firestone nor its representatives practice architecture. Firestone offers no opinion on and expressly disclaims any responsibility for the soundness of any structure. Firestone accepts no liability for structural failure or resultant damages. Consult a competent structural engineer prior to installation if the structural soundness or structural ability to properly support a planned installation is in question. No Firestone representative is authorized to vary this disclaimer.



STORAGE:

- Store away from sources of punctures, and physical damage.
- Assure that structural decking will support the loads incurred by material when stored on rooftop. The deck load limitations should be specified by the project designer.
- Store away from ignition sources as membrane will burn when exposed to open flame.

PRECAUTIONS:

- Exercise caution when lifting, moving, transporting, storing or handling membrane rolls to avoid sources of punctures and possible physical damage.
- Contact your Firestone Technical Coordinator at 1-800-428-4511 for specific recommendations regarding chemical or waste product compatibility with Firestone UltraPly TPO Membrane.
- Refer to Material Safety Data Sheets (MSDS) for safety information

LEED INFORMATION:

Post Consumer Recycled Content: 0%
Pre Consumer Recycled Content: 15%
Manufacturing Location(s): Wellford, SC
Tuscumbia, AL



CCMC 13348-R



Firestone Building Products Company, LLC
250 W. 96th Street, Indianapolis, IN 46260
Sales: (800) 428-4442 • Technical (800) 428-4511
www.firestonebpco.com

TECHNICAL INFORMATION SHEET

201
3/15/2011

UltraPly™ TPO

Firestone BUILDING PRODUCTS

PHYSICAL PROPERTIES

| Property | Test Method | ASTM D 6878 Specification | Typical Values | |
|-----------------------------------|---|---------------------------------|-------------------------------|-------------------------------|
| | | | 45 mil | 60 mil |
| Overall Thickness | ASTM D751 | 0.039" (1.0 mm) min | 0.045" (1.14 mm) ± 10% | 0.060" (1.5 mm) ± 10% |
| Coating Over Scrim | ASTM D6878, Annex A | 0.012" (0.305 mm) min | 0.020" (0.51 mm) | 0.025" (0.64 mm) |
| Breaking Strength | ASTM D751, Grab Method | 220 lb _f (975 N) min | 340 lb _f (1,510 N) | 390 lb _f (1,730 N) |
| Elongation at Reinforcement Break | ASTM D751, Grab Method | 15% min | 25% | 25% |
| Tearing Strength | ASTM D751 | 55 lb _f (245 N) min | 120 lb _f (530 N) | 120 lb _f (530 N) |
| Brittleness Point | ASTM D2137 | -40 °F (-40 °C) | Pass | Pass |
| Ozone resistance, no cracks | ASTM D1149 | Pass (no cracks) | Pass | Pass |
| Properties after Heat Aging | ASTM D573 | 670 h at 240 °F (116 °C) | | |
| Retention of Breaking Strength | ASTM D751, Grab Method | 90% min | > 90% | > 90% |
| Retention of Elongation at Break | ASTM D751, Grab Method | 90% min | > 90% | > 90% |
| Retention of Tearing Strength | ASTM D751 | 60% min | > 60% | > 60% |
| Weight Change | | ± 1% max | < 1% | < 1% |
| Linear Dimension Change | ASTM D1204 6 h at 158 °F (70 °C) | ± 1% max | < 1% | < 1% |
| Water Absorption | ASTM D471 | ± 3.0% max | < 3% | < 3% |
| Weather Resistance | ASTM G155, 80 °C Black Panel, no cracking, crazing when wrapped around a 3" mandrel and inspected at 7x magnification | 10,080 kJ/m ² min | > 20,160 kJ/m ² | > 20,160 kJ/m ² |
| Puncture Resistance | FTM 101C Method 2031 | --- | 265 lb _f (1,180 N) | 300 lb _f (1,300 N) |
| Dynamic Puncture Resistance MD | ASTM D5635 | --- | Pass (20 J) | Pass (40 J) |
| Dynamic Puncture Resistance CD | ASTM D5635 | --- | Pass (35 J) | Pass (50 J) |
| Static Puncture Resistance | ASTM D5602 | --- | Pass (25 kg) | Pass (25 kg) |

| ENERGY STAR® | White | Tan | Cool Roof Rating Council (CRRC) | White | Tan |
|----------------------------------|-------|------|---------------------------------|-------|------|
| Initial Solar Reflectance | 0.79 | 0.60 | Solar Reflectance (Initial) | 0.79 | 0.60 |
| Aged Solar Reflectance (3 years) | 0.78 | 0.54 | Solar Reflectance (Weathered) | 0.68 | 0.55 |
| Cleaned prior to aged test? | Yes | No | Thermal Emittance (Initial) | 0.85 | 0.81 |
| Initial Emittance | 0.85 | 0.81 | Thermal Emittance (Weathered) | 0.83 | 0.84 |

| LEED | Test Method | White | Tan | Gray |
|-------------------------------|-------------|-------|------|------|
| Solar Reflectance | ASTM E903 | 0.81 | 0.63 | 0.37 |
| Thermal Emittance | ASTM E408 | 0.95 | 0.95 | 0.95 |
| Solar Reflectance Index (SRI) | ASTM E1980 | 102 | 77 | 43 |

Firestone Building Products Company, LLC

Material Safety Data Sheet

June 10, 2011

Page: 1

SECTION 1: PRODUCT IDENTIFICATION

Product Name: Firestone UltraPly™ TPO Membrane

Chemical Name / Synonym: UltraPly™ TPO Thermoplastic Membrane (White, Tan, Gray), UltraPly™ TPO XR Thermoplastic Membrane (White, Tan, Gray), UltraPly™ TPO (MD) Thermoplastic Membrane (White, Tan, Gray), UltraPly™ TPO Reinforced Cover Strip (White, Tan, Gray), UltraPly™ TPO Reinforced Curb Corners (White, Tan, Gray), TPO18" Curb Flashing (White, Tan, Gray); UltraPly™ TPO Custom Accessories (White, Tan, Gray); UltraPly™ TPO Reinforced Split Pipe Boots (White, Tan, Gray); UltraPly™ TPO SA Membrane; UltraPly™ TPO HS

Chemical Family: Thermoplastic Polyolefin

24-Hour Emergency Phone: (800) 424-9300 CHEMTREC

Manufacturer's Name: Firestone Building Products Company, LLC

Manufacturer's Address: 250 West 96th Street, Indianapolis, IN 46260

NFPA Hazard Rating: Health 1, Flammability 1, Reactivity 0

HMS Hazard Rating: Health 0, Flammability 1, Reactivity 0

SECTION 2: CHEMICAL COMPOSITION

| Chemical Name: | Common Name: | CAS #: | % (by wt) | Exposure Limits: |
|---------------------------------------|--------------|--------|-----------|------------------|
| Nonhazardous as per 29 CFR 1910.1200. | None | None | 100 | None Established |

SECTION 3: HAZARD IDENTIFICATION

Primary Route of Exposure: None

Signs and Symptoms of Exposure: No known adverse effects

Medical Conditions Aggravated by Exposure: None known

Chronic Effects: No known adverse effects

Carcinogenicity: None

SECTION 4: FIRST AID MEASURES

First Aid Procedures: No special action necessary.

SECTION 5: FIRE FIGHTING PROCEDURES

Suitable Extinguishing Media: Carbon dioxide, foam, sand/earth, or dry chemicals.

Hazardous Combustion Products: Carbon dioxide and carbon monoxide, oxides of nitrogen, sulfur dioxide, partially burned carbon.

Recommended Fire Fighting Procedures: Wear impermeable protective clothing and self-contained breathing apparatus. Toxic fumes and vapors may be

Firestone Building Products Company, LLC

Material Safety Data Sheet

June 10, 2011

Page: 2

| | |
|-------------------------------------|------------------------|
| Unusual Fire and Explosion Hazards: | evolved. None known |
|-------------------------------------|------------------------|

SECTION 6: PRECAUTIONS FOR SAFE HANDLING AND USE

| | |
|--|---|
| Steps to Be Taken in Case Material is Released or Spilled: | Not Applicable |
| Precautions to Be Taken in Handling and Storing: | No special handling precautions. Store where materials are not exposed to excessive heat, cold or moisture. |

SECTION 7: EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|----------------------------|---|
| Ventilation: | Store and use in well ventilated areas. |
| Respiratory Protection: | None required |
| Eye Protection: | None required |
| Skin Protection: | None required |
| Other: | None |
| Work / Hygienic Practices: | Wash exposed skin prior to eating, drinking or smoking and at the end of each shift. Wash contaminated clothing prior to reuse. |

SECTION 8: PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|-------------------------|--|------------------------|---------|
| Appearance and Odor: | Black and white sheet, white and gray sheet, tan and gray sheet, gray and gray sheet, white sheet with fleece back membrane, white sheet, grey sheet, or tan sheet. Essentially no odor. | | |
| Flash Point: | Not Applicable | Lower Explosive Limit: | None |
| Method Used: | Not Applicable | Upper Explosive Limit: | None |
| Evaporation Rate: | Not Applicable | Boiling Point: | None |
| pH (undiluted product): | Not Applicable | Melting Point: | Unknown |
| Solubility in Water: | Insoluble | Specific Gravity: | 0.94 |
| Vapor Density: | Not Applicable | Percent Volatile: | Unknown |
| Vapor Pressure: | Not Applicable | | |

SECTION 9: STABILITY AND REACTIVITY

| | |
|---------------------------|----------------|
| Thermal Stability: | Stable |
| Hazardous Polymerization: | Will not occur |
| Conditions to Avoid: | None known |

SECTION 10: TRANSPORTATION

| | |
|------------------------|----------------|
| Regulatory Agency: | Not Regulated |
| Proper Shipping Name: | Not Applicable |
| Hazard Classification: | Not Applicable |
| Identification Number: | Not Applicable |
| Labels Required: | Not Applicable |

Firestone Building Products Company, LLC
Material Safety Data Sheet

June 10, 2011

Page: 3

Other Requirements: Not Applicable

SECTION 11: MISCELLANEOUS INFORMATION

Additional Comments: This product is considered an article as per 29 CFR 1910.1200 and is, therefore, exempt from the requirements of the Hazard Communication standard.

Date of Previous MSDS: December 6, 2010

Changes Since Previous MSDS: Additional product added under section 1 & company name information in disclaimer.

Telephone Number for Additional Information: (317) 575-7190

DISCLAIMER

The information contained herein is based on data considered accurate which has been obtained from other companies and organizations. However, no warranty or representation is expressed or implied that the information, is accurate, complete or representative. Firestone Building Products Company, LLC assumes no responsibility for injury to the buyer, the buyer's employees, or any third persons, if reasonable safety procedures are not followed. Additionally, Firestone Building Products Company, LLC assumes no responsibility for injury to buyer, the buyer's employees, or any third persons caused by abnormal use of this material, even if reasonable safety procedures are followed.

FIRESTONE TAPERED INSULATION

[RELATED SECTION 07 54 23]

Location: Main House, OM Closets, Flex OM

Dimensions:

Length: 4'

Width: 8'

Thickness: 1" to 2-1/2"

Features:

Compressive strength: 20 psi

Dimensional stability: 2% linear change

Moisture vapor transmission: less than 1 perm

Water absorption: less than 1% volume

Density: 2 pcf

Available: Firestone





ISO 95+™ GL Flat and Tapered

DESCRIPTION:

Firestone ISO 95+ GL flat and tapered roof insulation consists of a closed-cell polyiso foam core laminated to a black glass reinforced mat facer on both major surfaces. Flat and tapered ISO 95+ GL provide outstanding thermal performance on commercial roofing applications, while providing positive roof top drainage to help eliminate ponding water when tapered ISO 95+ GL is used.

All Firestone polyiso insulations use EPA accepted blowing agents and qualify under the Federal Procurement Regulation for Recycled Material. Flat and tapered ISO 95+ GL with IsoGard™ Foam Technology incorporates a HCFC-free blowing agent that does not contribute to the depletion of the ozone (ODP-free).

METHOD OF APPLICATION:

Insulation shall be neatly fitted to all roof penetrations, projections and nailers. No more insulation shall be installed than can be covered with membrane and completed before the end of each day's work or before the onset of inclement weather.

ISO 95+ GL FLAT AND TAPERED MUST BE INSTALLED

USING: Fasteners and plates, hot asphalt or Firestone approved insulation adhesives.

For ballasted systems, the top layer of Firestone insulation may not be mechanically attached.

| ISO 95+ GL Flute Span Over Metal Decks | | | | |
|--|--------|--------|-----------|------|
| Thickness | 1.0" | 1.25" | 1.5"-3.8" | 4.0" |
| Span | 2.625" | 3.675" | 4.375" | 4.5" |

SPECIFICATION COMPLIANCE:

ASTM C1289, Type II, Class 1

UL Classified

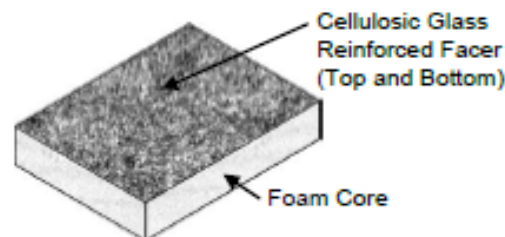
FM Class 1 Approved

Manufactured in an ISO 9002 Registered Facility

CAN/ULC-S704, Type 1, Class 3



CCMC 13274-L



PRODUCT DATA

| Typical Thickness | | LTTR* R-Value |
|-------------------|-------|---------------|
| (inches) | (mm) | |
| 1.00 | 25.4 | 6.0 |
| 1.25 | 31.7 | 7.5 |
| 1.50 | 38.1 | 9.0 |
| 1.75 | 44.5 | 10.5 |
| 2.00 | 50.8 | 12.1 |
| 2.30 | 58.4 | 14.0 |
| 2.50 | 63.5 | 15.3 |
| 2.80 | 71.1 | 17.2 |
| 3.00 | 76.2 | 18.5 |
| 3.25 | 82.6 | 20.1 |
| 3.50 | 88.9 | 21.7 |
| 3.75 | 95.3 | 23.4 |
| 4.00 | 101.6 | 25.0 |

*Long Term Thermal Resistance (LTTR) values provide a 15-year time-weighted average in accordance with CAN/ULC-S770.

POLYISO TYPICAL PROPERTIES

| Physical Property | ASTM Test | English Values | Metric Values |
|-----------------------------|-----------|-----------------|---------------------------------|
| Compressive Strength* | D 1621 | 20 psi, typical | 138 kPa, typical |
| Density | D 1622 | 2 pcf | 32 kg/m ³ |
| Dimensional Stability | D 2126 | <2% | <2% |
| Moisture Vapor Transmission | E 96 | <1.0 Perm | <57.5 ng/(Pa·s·m ²) |
| Water Absorption | C 209 | <1% by Volume | <1% by Volume |
| Service Temperature | | -100° to 250° F | -73° to 121° C |

*25 psi (172 kPa) available upon request.

AVAILABLE SIZES:

Flat Boards: 4' x 4' (1.22 m x 1.22 m)
4' x 8' (1.22 m x 2.44 m)
Thickness ranging 1.0" (25.4 mm) to 4.0" (101.6 mm)

Tapered Boards: 4' x 4' (1.22 m x 1.22 m)
4' x 8' (1.22 m X 2.44 m) (special order)
Thickness ranging 0.5" (12.7 mm) to 4.0" (101.6 mm)
Slopes ranging 1/16" per foot (.5%) to 1/2" per foot (4%)
See chart on page 2.

STORAGE AND PRECAUTIONS:

- Keep insulation dry at all times.
- Elevate insulation above the deck or ground.
- Cover insulation with waterproof tarps.
- Combustible. Refer to MSDS for more information.
- Do not install over wet, damp or uneven substrates.

MANUFACTURING LOCATIONS:

| | | |
|--------------|------------------|---------------|
| Aurora, CO | Florence, KY | Corsicana, TX |
| Bristol, CT | Jacksonville, FL | Salt Lake, UT |
| DeForest, WI | Youngwood, PA | |

Firestone Building Products Company
250 W. 96th Street, Indianapolis, IN 46260
Sales: (800) 428-4442 • Technical (800) 428-4511
www.firestonebpc.com

This sheet is meant to highlight Firestone's products and specifications and is subject to change without notice. Firestone takes responsibility for furnishing quality materials, which meet Firestone's published product specifications. Neither Firestone nor its representatives practice architecture. Firestone offers no opinion on and expressly disclaims any responsibility for the soundness of any structure. Firestone accepts no liability for structural failure or resultant damages. Consult a competent structural engineer prior to installation if the structural soundness or structural ability to properly support a planned installation is in question. No Firestone representative is authorized to vary this disclaimer.

LEED INFORMATION:

Firestone ISO 95+ GL flat and tapered can help contribute to overall L.E.E.D. certification due to its thermal efficiency (R-Value), recycled content, and zero ozone depletion. ISO 95+ GL flat and tapered can help achieve valuable credits in the following categories:

- Energy and Atmosphere
 - Benefits of commissioning building energy systems include lower energy use and lower operating costs.
 - Firestone ISO 95+ GL contains the highest R-Value per inch to help assist in the following credits:
 - EA Pre-requisite 2: Minimum Energy Performance
 - EA Credit 1: Optimize Energy Performance (1-19 points)
- Material & Resources
 - Benefits include the reduction of waste, as well the preservation of landfill space and raw materials.
 - Firestone ISO 95+ GL contains recycled content, can be re-used, and is manufactured strategically across the United States.
 - MR Credit 2: Construction Waste Management (1-2 points)
 - MR Credit 3: Material Re-Use (1-2 points)
 - MR Credit 4: Recycled Content (1-2 points)
 - MR Credit 5: Regional Material (1-2 points)

RECYCLE CONTENT OF ISO 95+ GL

| Typical Thickness (inches) | Thickness, (millimeters) | % Post Consumer | % Post Industrial | TOTAL RECYCLE CONTENT |
|----------------------------|--------------------------|-----------------|-------------------|-----------------------|
| 1.00 | 25.40 | 37% | 15% | 52% |
| 1.25 | 31.75 | 33% | 15% | 48% |
| 1.50 | 38.10 | 29% | 15% | 44% |
| 1.75 | 44.45 | 26% | 15% | 41% |
| 2.00 | 50.80 | 24% | 15% | 39% |
| 2.30 | 58.42 | 21% | 15% | 36% |
| 2.50 | 63.50 | 20% | 15% | 35% |
| 2.80 | 71.12 | 18% | 15% | 33% |
| 3.00 | 76.20 | 17% | 15% | 32% |
| 3.25 | 82.55 | 16% | 15% | 31% |
| 3.50 | 88.90 | 15% | 15% | 30% |
| 3.75 | 95.25 | 14% | 15% | 29% |
| 4.00 | 101.60 | 14% | 15% | 29% |

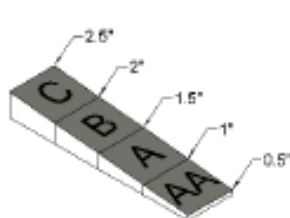
LEED Reference Guide information can be obtained on line at <http://www.usgbc.org/>.

"LEED is trademark of the U.S. Green Building Council."

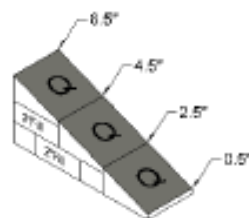
TAPERED ISO 95+ GL (Common Panel Types)

| Panel Code | Min-Max Thickness | | Slope | | Pieces Per Bundle (4'x4') |
|------------|-------------------|--------------------|----------|----|---------------------------|
| | | | | | |
| AA | 0.5" - 1.0" | 12.7 mm - 25.4 mm | 1/8"/ft. | 1% | 64 |
| A | 1.0" - 1.5" | 25.4 mm - 38.1 mm | 1/8"/ft. | 1% | 38 |
| B | 1.5" - 2.0" | 38.1 mm - 50.8 mm | 1/8"/ft. | 1% | 26 |
| C | 2.0" - 2.5" | 50.8 mm - 63.5 mm | 1/8"/ft. | 1% | 20 |
| G | 1.0" - 2.0" | 25.4 mm - 50.8 mm | 1/4"/ft. | 2% | 32 |
| H | 2.0" - 3.0" | 50.8 mm - 76.2 mm | 1/4"/ft. | 2% | 18 |
| I | 3.0" - 4.0" | 76.2 mm - 100.6 mm | 1/4"/ft. | 2% | 12 |
| X | 0.5" - 1.5" | 12.7 mm - 38.1 mm | 1/4"/ft. | 2% | 48 |
| Y | 1.5" - 2.5" | 38.1 mm - 63.5 mm | 1/4"/ft. | 2% | 24 |
| Z | 2.5" - 3.5" | 63.5 mm - 88.9 mm | 1/4"/ft. | 2% | 16 |
| Q | 0.5" - 2.5" | 12.7 mm - 63.5 mm | 1/2"/ft. | 4% | 32 |

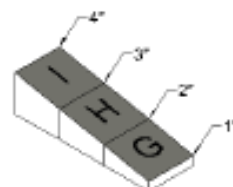
Contact Firestone's Estimating Services Department for a project quotation or for layout guidance. For site assistance or contractor support, contact Firestone's Tapered Project Management Team by calling: 1-800-428-4442 or by emailing: estimatingervicesdept@firestonebp.com



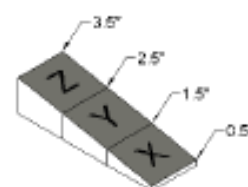
1/8"/ft. Tapered Section



1/2"/ft. Tapered Section



1/4"/ft. Tapered Section



1/4"/ft. Tapered Section

TECHNICAL INFORMATION SHEET

901
3/15/2011

Contact Firestone's Estimating Services Department for a project quotation or for layout guidance. For site assistance or contractor support, contact Firestone's Tapered Project Management Team by calling: 1-800-428-4442 or by emailing: estimatingervicesdept@firestonebp.com

Firestone Building Products Company

Material Safety Data Sheet

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SECTION 1: PRODUCT IDENTIFICATION

| | |
|--------------------------|---|
| Product Name: | ISO 95+ |
| Chemical Name / Synonym: | ISO 95+ Composite, ISO 95+ Nailbase, ISO 95+ Tapered, ISO 95+ GL, ISO 95+ CAN |
| Chemical Family: | Polyisocyanurate |
| 24-Hour Emergency Phone: | (800) 424-9300 CHEMTREC |
| Manufacturer's Name: | Firestone Building Products Company |
| Manufacturer's Address: | 250 West 96 th Street, Indianapolis, IN 46260 |
| NFPA Hazard Rating: | Health 1, Flammability 1, Reactivity 0 |
| HMIS Hazard Rating: | Health 1, Flammability 1, Reactivity 0 |

SECTION 2: CHEMICAL COMPOSITION

| Chemical Name: | Common Name: | CAS #: | % (by wt) | Exposure Limits: |
|---------------------------------------|--------------|------------|-----------|---|
| n-Pentane | n-Pentane | 109-66-0 | 0.05-5.5 | TLV 600 ppm PEL 1000 ppm |
| Ethyldimethylmethane | Isopentane | 78-78-4 | 4.5-9.9 | TLV 600 ppm PEL 1000 ppm |
| Tris (monochloropropyl) Phosphate | None | 13674-84-5 | <5 | None Established |
| Fibrous Glass | Fiberglass | None | <11 | TLV 1 f/cc TLV 5 mg/m ³ (inhalable) |
| Nonhazardous as per 29 CFR 1910.1200. | None | None | >71 | None Established |

SECTION 3: HAZARD IDENTIFICATION

| | |
|--|--|
| Primary Route of Exposure: | Inhalation |
| Signs and Symptoms of Exposure: | May cause irritation to the eyes, skin and respiratory tract. Inhalation of high vapor concentrations of pentanes used in this product may cause dizziness, headaches, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death. |
| Medical Conditions Aggravated by Exposure: | The dust produced by reprocessing of this product may aggravate pre-existing respiratory diseases. |
| Chronic Effects: | This product contains tris(monochloropropyl) phosphate, which may cause skin sensitization. |
| Carcinogenicity: | Direct implantation of glass fibers into the lung tissue of laboratory animals has produced lung fibrosis and lung cancer. Human epidemiological studies of inhalation exposure have yielded negative results. Continuous filament glass fibers is listed by IARC as a class 3, <i>unclassifiable as to carcinogenicity in humans</i> . |

Firestone Building Products Company

Material Safety Data Sheet

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SECTION 4: FIRST AID MEASURES

| | |
|-----------------------|---|
| First Aid Procedures: | For eyes, hold eyelids open and wash with gentle stream of water for at least 15 minutes preferably at eyewash fountain. For skin contact, wash affected area thoroughly with soap and water when time permits. For inhalation, remove to fresh uncontaminated air. |
|-----------------------|---|

SECTION 5: FIRE FIGHTING PROCEDURES

| | |
|---------------------------------------|--|
| Suitable Extinguishing Media: | Water spray, Alcohol foam, Carbon Dioxide, or Dry chemical. |
| Hazardous Combustion Products: | Carbon dioxide and carbon monoxide, phosphorus oxides, and phosphoric acid. |
| Recommended Fire Fighting Procedures: | Wear impermeable protective clothing and self-contained breathing apparatus. Toxic fumes and vapors may be evolved. |
| Unusual Fire and Explosion Hazards: | Emits dense, black smoke when burned. Certain operations such as grinding or cutting may lead to a buildup of dust suspended in air which can cause a dust explosion if ignited. Provide adequate ventilation and appropriate dust handling systems. Isopentane and n-pentane, highly flammable materials, may be present within this product. |

SECTION 6: PRECAUTIONS FOR SAFE HANDLING AND USE

| | |
|--|--|
| Steps to Be Taken in Case Material is Released or Spilled: | None required |
| Precautions to Be Taken in Handling and Storing: | Keep away from heat, sparks, and open flames. Store in a cool, dry area. Applying to hot surfaces requires special precautions. Protect against dust that may be generated by reprocessing, altering or applying this product. Remove dust by vacuuming rather than blowing. |

SECTION 7: EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|----------------------------|--|
| Ventilation: | Use in a well-ventilated location. |
| Respiratory Protection: | During reprocessing, altering, and/or applying this product, a NIOSH respirator may be required based upon the end user's airborne concentration evaluation. |
| Eye Protection: | Wear safety glasses with side shields when reprocessing, altering and/or applying this product. |
| Skin Protection: | Wear cotton or leather gloves when handling this product. |
| Other: | None required. |
| Work / Hygienic Practices: | Wash exposed skin prior to eating, drinking or smoking and at the end of each shift. Wash contaminated clothing prior to reuse. |

**Firestone Building Products Company
Material Safety Data Sheet**

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SECTION 8: PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|-------------------------|---------------------------------------|------------------------|---------|
| Appearance and Odor: | White rigid cellular sheets/odorless. | | |
| Flash Point: | Not Applicable | Lower Explosive Limit: | None |
| Method Used: | Not Applicable | Upper Explosive Limit: | None |
| Evaporation Rate: | Not Applicable | Boiling Point: | None |
| pH (undiluted product): | Not Applicable | Melting Point: | Unknown |
| Solubility in Water: | Insoluble | Specific Gravity: | Unknown |
| Vapor Density: | Not Applicable | Percent Volatile: | Unknown |
| Vapor Pressure: | Not Applicable | | |

SECTION 9: STABILITY AND REACTIVITY

| | |
|---------------------------|-----------------|
| Thermal Stability: | Stable |
| Hazardous Polymerization: | Will not occur. |
| Conditions to Avoid: | None known. |

SECTION 10: TRANSPORTATION

| | |
|------------------------|----------------|
| Regulatory Agency: | Not Regulated |
| Proper Shipping Name: | Not Applicable |
| Hazard Classification: | Not Applicable |
| Identification Number: | Not Applicable |
| Labels Required: | Not Applicable |
| Other Requirements: | Not Applicable |

SECTION 11: MISCELLANEOUS INFORMATION

| | |
|--|---|
| Additional Comments: | Physiological effects given in Section 3 are for dust and fume that may be generated during the reprocessing, altering or application of this product. Facers of this product may be foil, kraft paper, fiberglass, perlite, wood, black felt, or a combination of these. |
| Date of Previous MSDS: | February 9, 2009 |
| Changes Since Previous MSDS: | Additional product in section 1 |
| Telephone Number for Additional Information: | (317) 575-7190 |

DISCLAIMER

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XERO FLOR ROOT BARRIER**[RELATED SECTION 07 55 63]**

Model Number: XF112

Location: Flex OM

Features:

Installed on top of the roof membrane and below the other green roof components.

Water-impermeable sheet of 20mil low density polyethylene [LDPE].

Approval Certificates:

ASTM D1593

ASTM D1505

ASTM D638

ASTMD751

ASTM D101C Method 2065

ASTM D1004

ASTM G22

ASTM 1203

ASTM D746

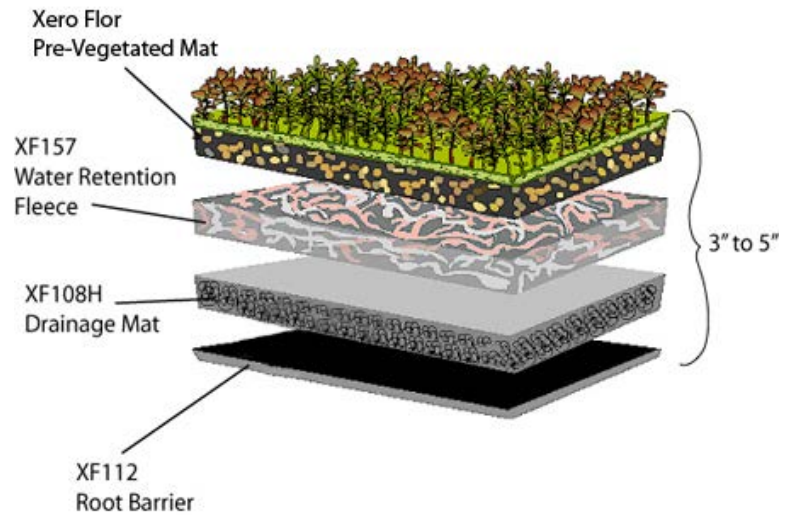
ASTM D1204

ASTM D5397 Method A

ASTM E96

FTMS 101C

Available: Xero Flor America





SIMPLY. SMARTER. GREEN ROOFS.

XF 112 Root Barrier (20 mil) – Product Information

Application

XF 112 is the root barrier component of the Xero Flor green roof system and protects the roof waterproofing membrane from direct contact or encroachment by plant roots. The XF 112 root barrier is optional depending on recommendations or requirements by the roof waterproofing membrane manufacturer or architect / builder. To avoid damage from wind uplift, the XF 112 should be secured during unrolling and covered immediately after installation.

Product Description

The XF 112 root barrier is a mono-layer membrane consisting of highly flexible, low-density polyethylene (LDPE). The material is delivered in desired widths – up to 20 ft - accordion-folded on 5 ft rolls.

| Properties | Test Method | Minimum Roll Averages | Typical Roll Averages |
|---|---|------------------------------------|---|
| Thickness mils (mm) | ASTM D 1593 | 18 (0.46) | 20 (0.51) |
| Density lb/ft ³ (g/cm ³) (Nom. wt 100 lb / 1000 ft ²) | ASTM D792 or ASTM D1505 | | 57.7 (.925) |
| Minimum Tensile Lbf/in width (N/cm width) | ASTM D638 1. Tensile strength at yield 2. % Elongation at yield 3. Tensile strength at break 4. % Elongation at break 5. Modulus @ 100% Elongation | 35 (61) 13% 84 (152) 650% | 40 (70) 13% 88 (154) 700% 32 (56) |
| Hydrostatic Resistance psi (kPa) | ASTM D751 | 118 (814) | 122 (841) |
| Puncture Resistance Lbf (N) | FTMS 101C Method 2065 | 33 (147) | 36 (160) |
| Tear Resistance Lbf (N) | ASTM D1004 | 11 (49) | 13 (58) |
| Volatile Loss - Method A | ASTM 1203 | | <1% |
| Resistance to Soil Burial (% change maximum in original value) | ASTM G22 Tensile strength at yield | | -4% |
| Low Temperature Impact Failure Temperature F (C) | ASTM D746 | | < -70 (< -94) |
| Dimensional Stability % Change | ASTM D 1204 | | < 2 |
| Environmental Stress Crack Resistance Hours to Failure | ASTM D5397 Method A | | > 400 |
| Carbon Black % | ASTM D1603 | 2.5 | 2.75 |
| WVTR g H ₂ O/100 in ² /24 hrs (g H ₂ O/m ² /24 hrs) | ASTM E96 Method A 73 °F, 50% RH | | .020 (.022) |
| Perms Grains/ft ² /hr/in.Hg (Grams/m ² /day/mm Hg) | ASTM E96 Method A 73 °F, 50% RH | | .027 (.032) |

XERO FLOR DRAIN MAT**[RELATED SECTION 07 55 63]**

Model Number: XF108H

Location: Flex OM

Dimensions:

Length: 197'

Width: 39-3/8"

Weight: .080 lbs / ft²

Features:

Area: 646 ft²

Thickness: 11/16"

Polymer: PET/PA

Water flow capacity pressure [psf]: 500-2000

Water flow rate [gla/min/ft²]: 17.5-3.0

A layer of flexible, non-woven, entangled polymeric filaments with a perforated, geotextile filter-fabric bonded to one side.

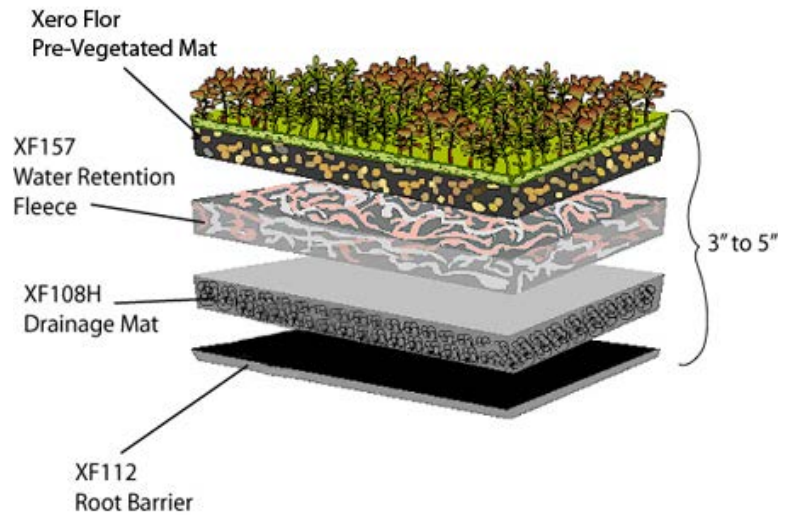
Approval Certificates:

ASTM D5993

ASTM D1777

ASTM D4632

Available: Xero Flor America





Xero Flor XF157 Retention Fleece – Product Information

Application

The XF157 Retention Fleece serves as both a water-holding capillary mat and filter-fabric component of the Xero Flor green roof system. The XF157 Retention Fleece layer allows storage and lateral wicking of rain or irrigation water for improved water storage and re-use by the vegetated layers. During installation, unrolled fleece should be secured with temporary ballast or by wetting and overlay with XeroTerra growing medium and/or Xero Flor vegetation mats.

Product Description

The XF157 Retention Fleece is a multicolored, needled fleece fabric delivered as end-tied poly-bagged rolls for shipping and transport. The XF157 Retention Fleece is composed of 100% post-consumer recycled polyester and polypropylene with trace content of other synthetic polymers.

Dimensions

| XF157 | Fleece per Roll | | | | | Unit Roll | | |
|-------|-----------------|--------------------|-------|--------|-----------------|-----------|--------|--------------|
| Type | Thickness | Weight | Width | Length | Area | Ø | Length | Gross Weight |
| Unit | in | oz/yd ² | in | ft | ft ² | in | in | lb |
| | 0.32 | 30 | 65 | 66 | 357.5 | 20 | 65 | 73 |

Properties

| Test | ASTM | Unit | Mean Value |
|---------------------------------|----------|---------------------|------------|
| Mass per unit area | D3776 | oz/yd ² | 30 |
| Thickness | D1777-96 | in | 0.32 |
| Tensile strength MD (Warp, WMD) | D5034 | lbs/in | 92 |
| Tensile strength CD (Fill, AMD) | D5034 | lbs/in | 97 |
| Water retention | -- | gal/ft ² | 0.19 |

XERO FLOR RETENTION FLEECE**[RELATED SECTION 07 55 63]**

Model Number: XF157

Location: Flex OM

Dimensions:

Length: 66'

Width: 65"

Weight: 30 oz /yd²

Features:

Area: 357.5 ft²

Thickness: 5/16"

Polymer: PET/PA

Water retention: .19 gal /ft²

Blend of recycled, synthetic fibers with a saturated weight of no more than 1.5 psf

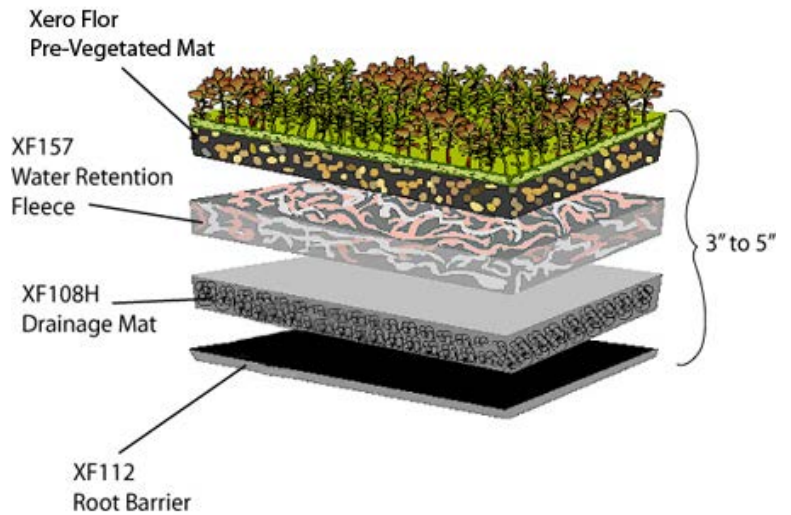
Approval Certificates:

ASTM D3776

ASTM D1777-96

ASTM D5034

Available: Xero Flor America





Xero Flor XF157 Retention Fleece – Product Information

Application

The XF157 Retention Fleece serves as both a water-holding capillary mat and filter-fabric component of the Xero Flor green roof system. The XF157 Retention Fleece layer allows storage and lateral wicking of rain or irrigation water for improved water storage and re-use by the vegetated layers. During installation, unrolled fleece should be secured with temporary ballast or by wetting and overlay with XeroTerra growing medium and/or Xero Flor vegetation mats.

Product Description

The XF157 Retention Fleece is a multicolored, needled fleece fabric delivered as end-tied poly-bagged rolls for shipping and transport. The XF157 Retention Fleece is composed of 100% post-consumer recycled polyester and polypropylene with trace content of other synthetic polymers.

Dimensions

| XF157 | Fleece per Roll | | | | | Unit Roll | | |
|-------|-----------------|--------------------|-------|--------|-----------------|-----------|--------|--------------|
| Type | Thickness | Weight | Width | Length | Area | Ø | Length | Gross Weight |
| Unit | in | oz/yd ² | in | ft | ft ² | in | in | lb |
| | 0.32 | 30 | 65 | 66 | 357.5 | 20 | 65 | 73 |

Properties

| Test | ASTM | Unit | Mean Value |
|---------------------------------|----------|---------------------|------------|
| Mass per unit area | D3776 | oz/yd ² | 30 |
| Thickness | D1777-96 | in | 0.32 |
| Tensile strength MD (Warp, WMD) | D5034 | lbs/in | 92 |
| Tensile strength CD (Fill, AMD) | D5034 | lbs/in | 97 |
| Water retention | -- | gal/ft ² | 0.19 |

PERMASNAP PARAPET WALL COPING

[RELATED SECTION 07 65 00]

Location: Main House

Dimensions:

Length: 10'

Width: 13"

Finish: anodized aluminum

Features:

24 gauge

Leg size: 4"

Approval Certificates:

ASTM D3776

ASTM D1777-96

ASTM D5034

Available: Hickman



Permasnap® Parapet Wall Coping



Standard Permasnap utilizes a metal chair which functions as both a gutter chair to channel water and as an internal splice plate in the same color and finish as the coping cap.

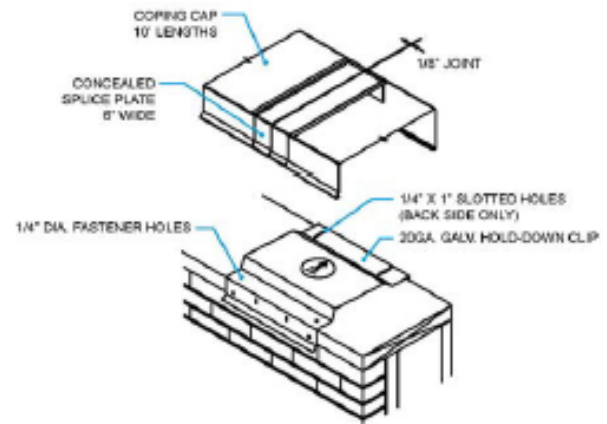
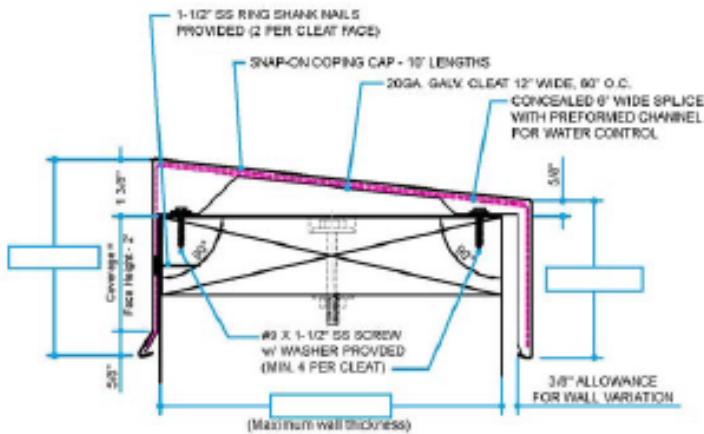
Internal metal chair drainage system eliminates caulked joints.

True welded radius, matching corners, end caps, and other accessories, are factory fabricated.

Standard Permasnap with a 20-gauge galvanized steel cleat is Approved for up to an FM 1-90 Wind Storm Rating and has a 20-Year, 110 mph Excel Warranty

UL Classified to meet the ANSI/SPRI ES-1 Roof Edge Standard Test Protocol RE-3 for coping

Pre-punched holes and supplied stainless steel fasteners for proper attachment and fast installation.



| Standard Sizes | Material | Gauge | Finishes |
|--|--|---------------------------------------|---|
| Wall Sizes - 6" - 32" | Aluminum | Standard is .050" & .063" | Mill Finish |
| Standard Leg Size - 4" Minimum Leg Size - 2.125" Maximum Leg Size - 12" | Galvanized Steel | Standard is 24 Gauge up to a 24" wall | Manufacturer's Standard Kynar 500® Colors |
| Miter Leg Lengths < 16" Wall = 23-1/4" 17" - 23" Wall = 29-1/4" 24" - 32" = custom length | Copper & Stainless Steel By Request | Other Metal Thicknesses By Request | Custom or Exotic Kynar 500® Post-Finished Colors |
| | | | Clear Anodize Bronze Anodize |

Permasnap® Coping

SPECIFICATIONS *(short form)*

The coping cap shall be the Permasnap® coping system as manufactured by the W.P. Hickman Company. The coping cap shall be formed as indicated with allowance for expansion and contraction. The standard support cleat shall be a 20 Ga. galvanized steel cleat with pre-slotted fastener holes. A 6" wide concealed joint cover with a pre-finished channel on the top surface to channel water shall be installed at coping joints. Installation shall conform to Manufacturer's written instructions.

DESCRIPTION

Application:

The product is a metal coping with hold down cleats and metal drain chairs for capping most any parapet. Standard coping is formed from .063" (1.60 mm) or .050" (1.25 mm) aluminum; 24ga. galv. steel with Kynar 500® coating; custom metal by request. Standard coping cap length is 10'. Cleats are 20ga. galvanized steel. Chairs are metal in the same color and finish as the coping cap. Fabricated to the wall width required between 6" and 32". Face and back leg are 4" (102mm) nominal length with tested approvals up to 6" (152mm). Custom sizes by request. Your Hickman Representative will be happy to discuss your special design requirements.

INSTALLATION PROCEDURES

NOTE: This is a general outline only.

Please refer to our full installation guide for additional specific detail.

Preparation:

The substrate should be flat and level from front to back. Shim areas not level.

Procedure:

The first cleat/chair set should be installed with the center line of the cleat set to the miter leg length (see chart on front page) and 24" (300mm) from the end of a wall. Install cleats/chairs sets at all corners and ends first, then work along the wall to the center locating sets every 60" on center for walls less than 17" and 40" on center for walls 17" - 32". Adjust the cleat location in the middle of a run to fit a short coping length. This procedure will provide a

symmetrical appearance of the installed coping. Install metal gutter chair/concealed joint covers at joint locations. Hook coping face leg over the cleat face (front) leg and swing over the top. Snap the roof side (back) leg by pressing firmly down on the back edge directly over the cleat chair sets. Leave a 1/4" gap at each joint for thermal movement.

FINISHES

- Natural mill aluminum
- Pre-coat Kynar 500®— from the manufacturer's standard color chart
- Post-coat Kynar 500®— industry standard two coat colors
- Non-standard Kynar 500®— colors requiring multiple coatings or protective clear coats
- Anodized aluminum – clear, bronze and black

GUARANTEE

A. Manufacturer's Standard

Warranty: Materials shall be free of defects in material and workmanship for five years after shipment. If, after inspection, the manufacturer agrees that the materials supplied by them are defective, the manufacturer shall at their option repair or replace them.

B. Special Performance/20-Year Excel

Warranty: Manufacturer shall guarantee that a coping system up to 32" wide, when installed per manufacturer's instructions, will not blow off, leak, or cause membrane failure, even in wind conditions up to 110 mph, or the manufacturer shall at their option repair or replace their materials.

C. Decorative Finish Warranty *(consult manufacturer).*

QUALITY ASSURANCE

Permasnap® coping is listed in the current FM Global Approval Guide approved for Windstorm ratings up to FM 1-90 depending upon wall width, cleat spacing, and gauge of cap. Consult FMRC Approval Guide or Hickman for other conditions. Permasnap coping is UL Classified to meet ANSI/SPRI ES-1 Test Method RE-3 for coping. The Permasnap® coping system has been tested simultaneously on the horizontal and vertical surfaces and has exceeded design wind pressure as calculated in accordance with the current edition of ANSI/SPRI ES-1 "Wind Design Standard for Edge Systems used with Low Slope Roofing Systems".

TECHNICAL SERVICES

Engineering and shop drawings are available from the factory. Product samples, detail sheets, color chips and color charts are ready for your submittal package. For personal assistance with questions or submittals, contact your local representative or call the W.P. Hickman Company.



The Leading Edge® since 1945

To find your Hickman representative call 1-800-892-9173
or visit our Internet web site at www.wph.com

Represented by:

DIVISION 08 **OPENINGS**

KOLBE ULTRA SERIES INSWING ENTRANCE DOORS

[RELATED SECTION 08 14 23.13]

Location: Main House, Flex Space

Features:

- Extruded aluminum clad exterior

- Fluoropolymer exterior finish

- Wood interior

- R-5 double glazed glass

Available: Kolbe & Kolbe Millwork Co.



RELATIVE DIMENSION CHART

1 WIDE, ACTIVE REQ'D DIMENSION W = WIDTH • H = HEIGHT

| KNOWN DIMENSION | GLASS SIZE | FRAME SIZE | ROUGH OPENING | UNIT DIM. | DAYLIGHT OPENING | CLEAR OPENING |
|------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|
| | GLASS SIZE | | W= +9.938 (252) H= +13.812 (351) | W= +10.438 (265) H= +14.312 (364) | W= +9.938 (252) H= +13.812 (351) | W= -1.000 (25) H= -1.000 (25) |
| FRAME SIZE | W= -9.938 (252) H= -13.812 (351) | | W= +.500 (13) H= +.500 (13) | | W= -10.938 (278) H= -14.812 (376) | W= -2.625 (67) H= -3.141 (80) |
| ROUGH OPENING | W= -10.438 (265) H= -14.312 (364) | W= -.500 (13) H= -.500 (13) | | W= -.500 (13) H= -.500 (13) | W= -11.438 (291) H= -15.312 (389) | W= -3.125 (79) H= -3.641 (92) |
| UNIT DIM. | W= -9.938 (252) H= -13.812 (351) | | W= +.500 (13) H= +.500 (13) | | W= -10.938 (278) H= -14.812 (376) | W= -2.625 (67) H= -3.141 (80) |
| DAYLIGHT OPENING | W= +1.000 (25) H= +1.000 (25) | W= +10.938 (278) H= +14.812 (376) | W= +11.438 (291) H= +15.312 (389) | W= +10.938 (278) H= +14.812 (376) | | W= +8.312 (211) H= +11.672 (296) |
| CLEAR OPENING | W= -7.312 (186) H= -10.672 (271) | W= +2.625 (67) H= +3.141 (80) | W= +3.125 (79) H= +3.641 (92) | W= +2.625 (67) H= +3.141 (80) | W= -8.312 (211) H= -11.672 (296) | |

2-WIDE, STAT/ACT REQ'D DIMENSION W = WIDTH • H = HEIGHT

| KNOWN DIMENSION | GLASS SIZE | FRAME SIZE | ROUGH OPENING | UNIT DIM. | DAYLIGHT OPENING | CLEAR OPENING |
|------------------|---|---|---|---|--|-----------------------------------|
| | GLASS SIZE | | W=(x2)+18.812 (478) H= +13.812 (351) | W=(x2)+19.312 (491) H= +14.312 (364) | W=(x2)+18.812 (478) H= +13.812 (351) | W= -1.000 (25) H= -1.000 (25) |
| FRAME SIZE | W=-18.812 (478) (+2) H=-13.812 (351) | | W= +0.500 (13) H= +0.500 (13) | | W=-20.812 (529) (-2) H= -14.812 (376) | W=-27.188 (691) H=-3.141 (80) |
| ROUGH OPENING | W=-19.312 (491) (+2) H=-14.312 (364) | W= -0.500 (13) H= -0.500 (13) | | W= -0.500 (13) H= -0.500 (13) | W=-21.312 (541) (-2) H= -15.312 (389) | W=-27.688 (703) H=-3.641 (92) |
| UNIT DIM. | W=-18.812 (478) (+2) H=-13.812 (351) | | W= +0.500 (13) H= +0.500 (13) | | W=-20.812 (529) (-2) H= -14.812 (376) | W=-27.188 (691) H=-3.141 (80) |
| DAYLIGHT OPENING | W=+1.000 (25) H= +1.000 (25) | W=(X2)+20.812 (529) H= +14.812 (376) | W=(x2)+21.312 (541) H= +15.312 (389) | W=(X2)+20.812 (529) H= +14.812 (376) | | W=+8.312 (211) H=+11.672 (296) |
| CLEAR OPENING | W=+7.312 (186) H=-10.672 (271) | W=(X2)+4.188 (106) H= +3.141 (80) | W=(x2)+4.688 (119) H= +3.641 (92) | W=(X2)+4.188 (106) H= +3.141 (80) | W= -8.312 (211) H= -11.672* (296) | |

2-WIDE, FRENCH REQ'D DIMENSION W = WIDTH • H = HEIGHT

| KNOWN DIMENSION | GLASS SIZE | FRAME SIZE | ROUGH OPENING | UNIT DIM. | DAYLIGHT OPENING | CLEAR OPENING |
|------------------|---|---|---|---|---|--|
| | GLASS SIZE | | W=(x2)+18.812 (478) H= +13.812 (351) | W=(x2)+19.312 (491) H= +14.312 (364) | W=(x2)+18.812 (478) H= +13.812 (351) | W= -1.000 (25) H= -1.000 (25) |
| FRAME SIZE | W=-18.812 (478) (+2) H=-13.812 (351) | | W= +0.500 (13) H= +0.500 (13) | | W=-20.812 (529) (+2) H= -14.812 (376) | W=-2.626 (67) H=-3.141 (80) |
| ROUGH OPENING | W=-19.312 (491) (+2) H=-14.312 (364) | W= -0.500 (13) H= -0.500 (13) | | W= -0.500 (13) H= -0.500 (13) | W=-21.312 (541) (+2) H= -15.312 (389) | W=-3.126 (79) H=-3.641 (92) |
| UNIT DIM. | W=-18.812 (478) (+2) H=-13.812 (351) | | W= +0.500 (13) H= +0.500 (13) | | W=-20.812 (529) (+2) H= -14.812 (376) | W=-2.626 (67) H=-3.141 (80) |
| DAYLIGHT OPENING | W=+1.000 (25) H= +1.000 (25) | W=(X2)+20.812 (529) H= +14.812 (376) | W=(x2)+21.312 (541) H= +15.312 (389) | W=(X2)+20.812 (529) H= +14.812 (376) | | W=(x2)+18.188 (462) H=+11.672 (296) |
| CLEAR OPENING | W=-16.188 (411) (+2) H=-10.672 (271) | W=+2.626 (67) H= +3.141 (80) | W= +3.126 (79) H= +3.641 (92) | W=+2.626 (67) H= +3.141 (80) | W= -18.188 (462) (+2) H= -11.672 (296) | |

() = Dimension in millimeters

Some installation procedures will require a larger rough opening than noted (ie: installations utilizing our installation clips), therefore, you may need to increase the rough opening size accordingly. Rough opening gaps may be increased up to a maximum of 1/2" on all sides and still be within good practice guidelines.

3-WIDE, STAT/ACT/STAT REQ'D DIMENSION
W = WIDTH • H = HEIGHT

KNOWN DIMENSION

| | GLASS SIZE | FRAME SIZE | ROUGH OPENING | UNIT DIM. | DAYLIGHT OPENING | CLEAR OPENING |
|-------------------------|---|--|--|--|--|-------------------------------------|
| GLASS SIZE | | W=(x3) +27.688 (703) H= +13.812 (351) | W=(x3) +28.188 (716) H= +14.312 (364) | W=(x3) +27.688 (703) H= +13.812 (351) | W= -1.000 (25) H= -1.000 (25) | W= +7.312 (186) H= +10.672 (271) |
| FRAME SIZE | W=-27.688 (703) (+3) H=-13.812 (351) | | W= +0.500 (13) H= +0.500 (13) | | W=-30.688 (779) (+3) H= -14.812 (376) | W=-51.750 (1314) H= -3.141 (80) |
| ROUGH OPENING | W=-28.188 (716) (+3) H=-14.312 (364) | W= -0.500 (13) H= -0.500 (13) | | W= -0.500 (13) H= -0.500 (13) | W=-31.188 (792) (+3) H= -15.312 (389) | W=-52.250 (1327) H= -3.641 (92) |
| UNIT DIM. | W=-27.688 (703) (+3) H=-13.812 (351) | | W= +0.500 (13) H= +0.500 (13) | | W=-30.688 (779) (+3) H= -14.812 (376) | W=-51.750 (1314) H= -3.141 (80) |
| DAYLIGHT OPENING | W=+1.000 (25) H= +1.000 (25) | W=(X3) +30.688 (779) H= +14.812 (376) | W=(X3) +31.188 (792) H= +15.312 (389) | W=(X3) +30.688 (779) H= +14.812 (376) | | W=+8.312 (211) H= +11.672 (296) |
| CLEAR OPENING | W=+7.312 (186) H=-10.672 (271) | W=+51.750 (1314) H= +3.141 (80) | W=+52.250 (1327) H= +3.641 (92) | W=+51.750 (1314) H= +3.141 (80) | W= -8.312 (211) H= -11.672 (296) | |

() = Dimension in millimeters

Some installation procedures will require a larger rough opening than noted (ie: installations utilizing our installation clips), therefore, you may need to increase the rough opening size accordingly. Rough opening gaps may be increased up to a maximum of 1/2" on all sides and still be within good practice guidelines.

SIZE LIMITATIONS FOR INSWING DOOR UNITS

| |
|--|
| One Panel (based on door size) |
| Maximum |
| Width: 48" |
| Height: 120" |
| Any panel over 3-0 x 8-0 or 3-6 x 6-8 must use 6" stiles and top rail along with ball bearing butt hinges. Units that exceed 3-6 x 9-0 can not be prehung. Non-standard size panels will be finished with our K-Kron II finish - the frame however will be clad. |

Additional Limitations

A mull unit can not exceed 168" (14') x 108" (9') overall. Larger sized mull unit assemblies may require alternate installation methods or field mulling.

Glass ratio can not exceed 6:1 for annealed glass.

Glass ratio can not exceed 8:1 for tempered glass.

MASONITE FLUSH POCKET DOOR

[RELATED SECTION 08 14 73]

Location: Core Module

Dimensions:

Width: 3'

Height: 80"

Depth: 1-3/4"

Features:

Smooth finish, primed for painting

Solid core construction

Birch veneer

Laminated galvalume sheet on side facing the bathroom

Grey Benjamin Moore paint on side facing the hallway

Available: Home Depot





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- Assembled Depth (in.) : 1.75 in
- Assembled Height (in.) : 80 in
- Assembled Width (in.) : 36 in
- Commercial : No
- Depth (in.) : 1.75 in
- Door Color Family : Light Brown Wood
- Door Handing : Universal/Reversible
- Door Material : Other
- Door Thickness : 1.75 in
- Door Type : Exterior Slab
- Door Width (in.) : 36
- Door color : Birch
- Fire rating : None
- Height (in) : 80 in

KAWNEER ENCORE THERMAL FRAMING SYSTEM

[RELATED SECTION 08 43 13]

Model Number: Custom

Location: Living Module

Dimensions:

Width: 8'

Height: 6'

Features:

1-3/4" sight line with a 3-9/16" depth

Screw spline system

Outside glazed

Thermal break via Polymer glazing clip

Available: Kaweer





--search--



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▼ **EnCORE® Thermal Framing System**

- Overview
- BIM Models
- CAD & Spec Download
- Literature
- Concealed Vent
- Finishes
- Misc. Framing
- Order Literature

Products A - Z

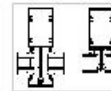
▼ **Products by Category**

- ▶ New Products
- ▶ Blast Resistant Products
- ▶ Curtain Wall
- ▶ Entrances - Sliding
- ▶ Entrances - Swing
- ▶ Framing - Interior/Partitions
- ▶ High-Performance Thermal Products
- ▶ Hurricane Resistant Products
- ▶ Overhead Glazing
- ▼ Storefronts - Framing
 - Trifab® 400
 - Trifab® SunShade
 - Trifab® VersaGlaze® 450 Standard (1-3/4 inch sightline)
 - Trifab® VersaGlaze® 450 Optional (2-inch sightline)
 - Trifab® 451UT
 - Trifab® VersaGlaze® 451/451T
 - EnCORE® Thermal Framing System
 - IR 500/501 Framing
 - IR 501UT Framing
 - 516 IsoPort™ Window
 - 518 IsoPort™ Window
 - PG 123® ISOWEB® Framing
 - Miscellaneous Framing
 - Forster presto (Fire-Rated Steel Entrances+Framing)
 - Forster fuego light (Fire-Rated Steel)

EnCORE® Thermal Framing System

Kawneer NA > Products > Products by Category > Storefronts - Framing > EnCORE® Thermal Framing System

Product Images



Product Specifications

Taking center stage in Kawneer's lineup, EnCORE® Thermal Framing System is a two-piece, face-and-gutter system that offers thermal economy, a Structural Silicone Glazing (SSG) option and numerous design choices.

Engineered for easy installation and lower costs, features include the unique QuickSeal™ self-sealing system, a broad selection of system depths and a 1 3/4-inch (44.5) minimal sightline.

EnCORE® readily adapts to remodel projects and new construction, whether traditional or modern architecture.

Key Features Include:

- > Economical
- > 1-3/4" (44.5) sightline with a 3-9/16" (90.5), 4-1/2" (114.3) or 6" (152.4) depth
- > Front or Center (4-1/2") glass applications
- > Outside glazed
- > Screw Spline, Shear Block or Type-B fabrication
- > SSG option
- > Infill options up to 1-1/8" (28.6)
- > Thermal break via. Polymer glazing clip
- > Permanodic® anodized finishes in 7 standard choices
- > Painted finishes in 42 standard choices and unlimited custom choices

Optional Features

- > Two color capability
- > 1-1/4" (31.8) perimeter sightline
- > Project specific U-factors (See Thermal Charts)

For more detailed information on this product, reference the document(s) available for download below.



[EnCORE® Thermal Framing System - Flyer \[357KB\]](#)



[EnCORE® Thermal Framing System - Architectural Detail Manual \[4948KB\]](#)

Viewing documents in PDF format requires Adobe **Acrobat Reader**, which is available as a free download from the Adobe Web site.

FEATURES

- Economical
- 1-3/4" sight line with a 3-9/16", 4-1/2" or 6" depth
- Front or Center (4-1/2") glass applications
- Outside glazed
- Screw Spline, Shear Block or Type-B fabrication
- SSG option
- Infill options up to 1-1/8"
- Thermal break via. Polymer glazing clip
- Permanodic® anodized finishes in 7 standard choices
- Painted finishes in standard and custom choices

OPTIONAL FEATURES

- Two color capability
- 1-1/4" perimeter sight line
- Project specific U-factors (See Thermal Charts)

PRODUCT APPLICATIONS

- Storefront, Ribbon Window or Punched Openings
- Low to mid-rise
- Single-span
- Curved frames
- Integrated entrance framing allowing Kawneer entrances or other specialty entrances to be included
- Kawneer Sealair® windows or GLASSvent® are easily incorporated

For specific product applications,
consult your Kawneer Representative

KOLBE CLAD CASEMENT OPERATING WINDOWS

[RELATED SECTION 08 52 13]

Location: Main House, Flex Space

Features:

- Extruded aluminum clad exterior

- Fluoropolymer exterior finish

- Wood interior

- R-5 double glazed glass

Available: Kolbe & Kolbe Millwork Co.



NOTE: W = WIDTH
H = HEIGHT

| | GLASS SIZE | FRAME SIZE | ROUGH OPENING | UNIT DIM. | DAYLIGHT OPENING | CLEAR OPENING | |
|-----------------|------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| KNOWN DIMENSION | GLASS SIZE | W= +5.375" (137) H= +5.375" (137) | W= +5.875" (149) H= +5.875" (149) | W= +5.375" (137) H= +5.375" (137) | W= -1.000" (25) H= -1.000" (25) | W= -1.562" (40) H= +0.500" (13) | |
| | FRAME SIZE | W= -5.375" (137) H= -5.375" (137) | W= +0.500" (13) H= +0.500" (13) | | W= -6.375" (162) H= -6.375" (162) | W= -8.312" (211) H= -4.875" (124) | |
| | ROUGH OPENING | W= -5.875" (149) H= -5.875" (149) | W= -0.500" (13) H= -0.500" (13) | | W= -6.875" (175) H= -6.875" (175) | W= -8.812" (224) H= -5.375" (137) | |
| | UNIT DIM. | W= -5.375" (137) H= -5.375" (137) | | W= +0.500" (13) H= +0.500" (13) | | W= -6.375" (162) H= -6.375" (162) | W= -8.312" (211) H= -4.875" (124) |
| | DAYLIGHT OPENING | W= +1.000" (25) H= +1.000" (25) | W= +6.375" (162) H= +6.375" (162) | W= +6.875" (175) H= +6.875" (175) | W= +6.375" (162) H= +6.375" (162) | | W= -2.562" (65) H= +1.500" (38) |
| | CLEAR OPENING | W= +1.562" (40) H= -0.500" (13) | W= +8.312" (211) H= +4.875" (124) | W= +8.812" (224) H= +5.375" (137) | W= +8.312" (211) H= +4.875" (124) | W= +2.562" (65) H= -1.500" (38) | |

() = DIMENSION IN MILLIMETERS

Unit dimension height calculations utilize Traditional sill nosing. If sill drip is used, the unit dimension height will differ.

For Units with concealed hinge: frame width - 3.812 = clear opening width

Some installation procedures will require a larger rough opening than noted (i.e.: installation utilizing our installation clips), therefore, you may need to increase the rough opening size accordingly. Rough opening gaps may be increased up to a maximum of 1/2" on all sides and still be within good practice guidelines.

OTHER COMMON DIMENSION FORMULAS

All formulas are based using standard 2 1/4" stiles and rails.

| Description | Width | Height |
|----------------------------------|---------|---------|
| Frame Size to Sash OSM | - 1.875 | - 1.875 |
| Frame Size to Sash Opening | - 1.562 | - 1.562 |
| Sash OSM to Glass Size | - 3.500 | - 3.500 |
| Glass Size to Swing Screen OSM | + 2.062 | + .812 |
| Casement Direct Set F.S. to G.S. | - 2.375 | - 2.375 |
| S.O. to Sash OSM | - .312 | - .312 |

SIZE LIMITATIONS FOR CASEMENT UNITS

| One-Lite Venting (based on frame size) | | One-Lite Stationary (based on frame size) | |
|---|-------------|---|-------------|
| Maximum | Minimum | Maximum | Minimum |
| Width: 36" | Width: 16" | Width: 120" | Width: 12" |
| Height: 96" | Height: 18" | Height: 120" | Height: 12" |
| Square footage of entire unit must be within 18 sq. ft. for both insulating and single glazed units. (i.e.: a unit that is 36" wide can only be 72" high, however a unit which is 24" wide can be 90" tall) | | Square footage of entire unit must be within 53 sq. ft. for both insulating and single glazed units. (i.e.: a unit that is 120" in one direction may only be 60" in the other.) Units over 40 sq. ft. must be tempered. | |

A mull unit can not exceed 168" (14') x 108" (9') overall. Larger sized mull unit assemblies may require alternate installation methods or field mulling.

Glass ratio can not exceed 6:1 for annealed glass.

Glass ratio can not exceed 8:1 for tempered glass.

PLEXIGLASS SG PLUS

[RELATED SECTION 08 63 00]

Location: Core Module

Dimensions:

Length: 16' 3-1/2" [4966 mm]

Width: 8' 3" [2515 mm]

Height: 1/8" [4.5 mm]

Color: colorless


Features:

Critical craze stress: 1600 psi

Impact energy: 39 in/lbs

Available: Altuglas International





A complete product line,
no matter what your **sign**.



Plexiglas®

Plexiglas® SG Plus

CRAZE-RESISTANT IMPACT ACRYLIC SHEET

What's your sign? Geminis tend to have dual characteristics – they're attractive and they're very versatile. That's why Plexiglas® SG Plus craze-resistant impact acrylic sheet is your material. It not only exhibits outstanding thermoforming definition, it's well suited to both channel letter and pan face signs.

Designed specifically to meet the stringent requirements of the quantity and custom sign markets, Plexiglas® SG Plus acrylic sheet has the properties you desire: impact resistance and enhanced machinability.

It's an excellent substrate for channel letters. At 8 times the impact strength of straight acrylic, it will resist in-shop, in-transit, installation, and in-service breakage. If your sign is a pan face, Plexiglas® SG Plus craze-resistant impact acrylic sheet offers outstanding thermoforming definition along with enhanced craze resistance to protect from paint solvents.

- **Enhanced machinability.**
- **Easily fabricated and decorated.**
- **Outstanding thermoforming definition.**
- **Eight times tougher than straight acrylic.**
- **Excellent weatherability and optical clarity.**
- **Resistant to chemicals.**
- **Available in colorless, white and several popular sign colors.**
- **Available on reels and as sheet stock.**
- **Exceptional lot-to-lot consistency.**

Plexiglas® SG Plus

CRAZE-RESISTANT IMPACT ACRYLIC SHEET

Plexiglas® SG Plus craze-resistant impact acrylic sheet also provides excellent craze-resistance properties even after exposure to the harsh solvents, paints, paint thinners and cleaners typically used in the sign industry.

Below, Chart A shows how Plexiglas® SG Plus acrylic sheet outperforms continuous cast impact modified acrylic (CC IMA) when tested with isopropyl alcohol (IPA).

Chart B shows that the impact strength of Plexiglas® SG Plus acrylic sheet is higher than continuous cast impact modified acrylic (CC IMA).

For more information, contact your local Altuglas International sales representative or call 800-523-7500.

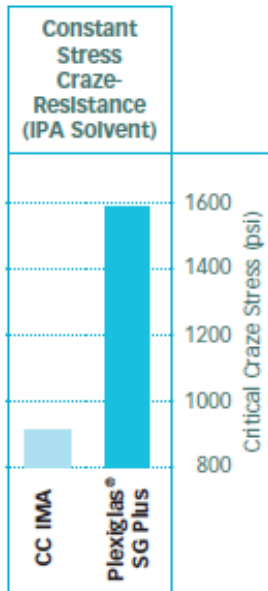


Chart A

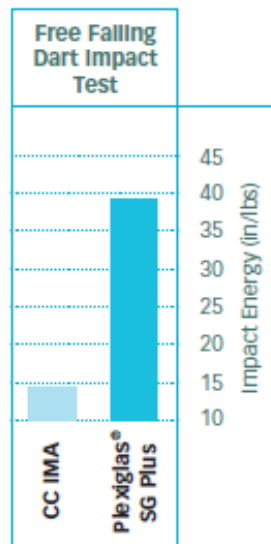


Chart B

COLOR OFFERING

| THICKNESS | SHEET SIZE |
|----------------|------------|
| 0.118" (3mm) | 51" x 100" |
| 0.177" (4.5mm) | 51" x 100" |
| 0.177" (4.5mm) | 75" x 100" |

| | | | |
|-----------|-------|-------|-------|
| RED | 62157 | 62283 | 62793 |
| BLACK | 62025 | | |
| YELLOW | 62037 | | |
| GREEN | 62108 | | |
| BLUE | 62114 | | |
| ORANGE | 62119 | | |
| IVORY | 62146 | | |
| WHITE | 67328 | | |
| COLORLESS | | | |

STANDARD OFFERING

Colorless + 67328 White

| THICKNESS | SHEET SIZE | REEL WIDTHS |
|----------------|------------|-------------|
| 0.118" (3mm) | 48" x 96" | 39" |
| 0.150" (3.8mm) | 60" x 96" | 51" |
| 0.177" (4.5mm) | 72" x 96" | 63" |
| | 51" x 100" | 75" |
| | 63" x 100" | 100" |
| | 75" x 100" | |

Altuglas International
 Arkema Inc.
 2000 Market Street
 Philadelphia, PA 19103-3222
 Tel. 215-419-7000
 Fax 215-419-5512
www.altuglasint.com
www.plexiglas.com

Plexiglas® acrylic plastic is a combustible thermoplastic. Observe fire precautions appropriate for comparable forms of wood and paper. For building uses, check code approvals. Impact resistance is a factor of thickness. Avoid exposure to heat or aromatic solvents. Clean with soap and water. Avoid abrasives.

The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, Arkema expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY EXPRESS OR IMPLIED IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process. The user should thoroughly test any application before commercialization. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the user is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement.

See MSDS for Health & Safety Considerations.
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 ADV#05-052R/CV/APL/9-06/3M



Plexiglas (R) SG PLUS Impact Acrylic Sheet

Material Safety Data Sheet

Arkema Inc.

1 PRODUCT AND COMPANY IDENTIFICATION

Altuglas International
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

| Information Telephone Numbers | Phone Number | Available Hrs |
|---|----------------|----------------------|
| Altuglas International Customer Service | (800) 523-1532 | 8:00 am - 6:00pm EST |

Product Name Plexiglas (R) SG PLUS Impact Acrylic Sheet
Product Synonym(s)

Chemical Family Acrylic Copolymer
Chemical Formula N/A
Chemical Name Acrylic Copolymer
EPA Reg Num
Product Use

2 COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredient Name | CAS RegistryNumber | Typical % | OSHA |
|---------------------|--------------------|--------------|------|
| Methyl methacrylate | 80-62-6 | 0.9 MAXIMUM | Y |
| P(EA/MMA) | Proprietary | 99.1 MINIMUM | N |

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

While this material is not classified as hazardous under Federal OSHA regulations, this MSDS contains valuable information critical to the safe handling and proper use of this product. This MSDS should be retained and available for employees and other users of this product.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Clear to opaque sheet in various colors.

Odorless

MELT PROCESSING RELEASES VAPORS WHICH MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. As a finished product, it is a synthetic, high molecular weight polymer. Due to its chemical and physical properties, this material does not require special handling other than the good industrial hygiene and safety practices employed with any industrial material of this type.

Ethyl acrylate is classified as possibly carcinogenic to humans (Group 2B) by the International Agency for Research on Cancer (IARC).



4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water.

IN CASE OF CONTACT, flush the area with plenty of water. Remove material from clothing. Wash clothing before reuse.

IF INHALED, remove to fresh air.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

| | | |
|---------------------------|--------------|--------------------|
| Auto-Ignition Temperature | >400 C/752 F | |
| Flash Point | NA | Flash Point Method |
| Flammable Limits- Upper | NA | |
| Lower | NA | |

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Heated material can form flammable vapors with air.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Contain spill. Sweep or scoop up and remove to suitable container. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Avoid temperature extremes during storage; ambient temperature preferred.

Storage

Use only with adequate ventilation.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Use good industrial practice to avoid eye contact.



8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Skin Protection

Minimize skin contamination by following good industrial hygiene practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

Respiratory Protection

Avoid breathing dust. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

| Exposure Limit | | Value |
|-----------------------------|---|---------------------|
| Methyl methacrylate | | |
| ACGIH Sensitizer Designator | - | Y |
| ACGIH STEL | - | 100 ppm (410 mg/m3) |
| ACGIH TWA | - | 50 ppm (205 mg/m3) |
| OSHA TWA PEL | - | 100 ppm (410 mg/m3) |

-Only those components with exposure limits are printed in this section.

-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.

-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---------------------|--|
| Appearance/Odor | Clear to opaque sheet in various colors. Odorless |
| pH | NA |
| Specific Gravity | 1.15 to 1.19 |
| Vapor Pressure | NA |
| Vapor Density | NA |
| Melting Point | 132 C/270 F |
| Freezing Point | NA |
| Boiling Point | NA |
| Solubility In Water | insoluble |
| Percent Volatile | 0 |



10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Hazardous Polymerization

Does not occur.

Incompatibility

Prolonged contact with acids, alkalis and strong oxidizing agents may attack or dissolve the polymer.

Hazardous Decomposition Products

Thermal decomposition may yield acrylic monomers.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

No data are available.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

No data are available.

Chemical Fate Information

No data are available.

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Incineration is the recommended method for disposal observing all local, state and federal regulations.

14 TRANSPORT INFORMATION

| | |
|--------------------|---------------|
| DOT Name | NOT REGULATED |
| DOT Technical Name | |
| DOT Hazard Class | |
| UN Number | |
| DOT Packing Group | PG |
| RQ | |

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

| | | | |
|--------------------------|---|----------------------------|---|
| Immediate (Acute) Health | Y | Fire | N |
| Delayed (Chronic) Health | N | Reactive | N |
| | | Sudden Release of Pressure | N |



Plexiglas (R) SG PLUS Impact Acrylic Sheet

Material Safety Data Sheet

Arkema Inc.

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

| SARA Reportable Quantities | CERCLA RQ | SARA TPQ |
|----------------------------|-----------|----------|
| Methyl methacrylate | 1000 LBS | |
| P(EA/MMA) | NE | |

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Methyl methacrylate

Massachusetts Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Methyl methacrylate

New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Methyl methacrylate

Pennsylvania Environmental Hazard

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Methyl methacrylate

Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Methyl methacrylate

16 OTHER INFORMATION

Revision Information

Revision Date 03 MAY 2005 Revision Number 12
Supersedes Revision Dated 03-MAY-2005

Revision Summary

The Atoglas Division of Arkema Inc. has changed its name to Altuglas International.

Key

NE= Not Established NA= Not Applicable (R) = Registered Trademark



Plexiglas (R) SG PLUS Impact Acrylic Sheet

Material Safety Data Sheet

Arkema Inc.

Arkema Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of Arkema Inc., Arkema Inc. expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.

JOHNSON POCKET DOOR FRAME

[RELATED SECTION 08 71 00]

Model Number: 203070PF

Location: Core Module

Dimensions:

Height: 84"

Width: 36"

Depth: 1-3/4"

Finish: Brushed nickel plated

Features:

Maximum door size [W x H x D]: 36" x 96" x 1-3/4"

Maximum door weight: 300 lbs

Available: Lowes



2060 POCKET DOOR FRAME

[HARDWARE INDEX](#)

MAX DOOR SIZE: 60" x 108" x 2-1/4", (5'- 0" x 9'- 0"), [1524mm x 2743mm x 57mm]

MAX DOOR WEIGHT: 300lbs. [136kg.] EACH

FINISH WALL THICKNESS: 6-9/16" [167mm] (2 x 6 walls)



FOR 2 x 6 INTERNAL WALLS

Heavy duty pocket door frame featuring heavy gauge all steel split studs for maximum wall rigidity. New all steel split stud design makes a pocket door wall sheathed with standard wall board material comparable in stiffness to standard non pocket door stud walls and eliminates warpage. The 2060 is designed like the rest of our pocket door frames so it can be used for single or converging pocket door applications. The 2060 is packaged for easy transport and fast installation in standard 2 X 6 timber or steel framed stud walls. Versatile frames can be adapted for use in thicker walls, block walls and cut down to accept any smaller size door size.




[SINGLE POCKET DOOR](#)

[CONVERGING POCKET DOORS](#)

JOHNSON HARDWARE® 2060 SERIES POCKET DOOR FRAMES CAN BE CUT DOWN TO ACCEPT ANY SMALLER SIZE DOOR



84" (7'- 0") [2134mm] MAX DOOR HEIGHTS

| PART NO. | DESCRIPTION | MAXIMUM DOOR WIDTH | MAXIMUM DOOR HEIGHT | MAXIMUM DOOR THICKNESS | BUY NOW! |
|-----------|---|-------------------------|-------------------------|------------------------|--|
| *202670PF |  <p>FRAME CONTENTS: 1 - HEADER LENGTH 2 - UPRIGHT PAIRS 2 - FLOOR BRACKETS</p> | 30" (2'-6") [762mm] | 84" (7'-0") [2134mm] | 1-3/4" [45mm] | <p>CLICK HERE TO Buy On-Line</p> |
| *203070PF | <p>2 - 2020 HANGERS 1 - 1550 DOOR GUIDE 1 - 1513 DOOR STOP 1 - 1575 1-3/4" DOOR ADAPTOR KIT</p> | 36" (3'-0") [914mm] | 84" (7'-0") [2134mm] | 1-3/4" [45mm] | |
| 204070PF |  <p>FRAME CONTENTS: 1 - HEADER LENGTH 3 - UPRIGHT PAIRS 2 - FLOOR BRACKETS 2 - 2020 HANGERS 1 - 1550 DOOR GUIDE 1 - 1513 DOOR STOP 1 - 1575 1-3/4" DOOR ADAPTOR KIT</p> | 48" (4'-0") [1219mm] | 84" (7'-0") [2134mm] | 1-3/4" [45mm] | |
| 205070PF |  <p>FRAME CONTENTS: 1 - HEADER LENGTH 4 - UPRIGHT PAIRS 2 - FLOOR BRACKETS 2 - 2020 HANGERS 1 - 1550 DOOR GUIDE 1 - 1513 DOOR STOP 1 - 1575 1-3/4" DOOR ADAPTOR KIT</p> | 60" (5'-0") [1524mm] | 84" (7'-0") [2134mm] | 1-3/4" [45mm] | |

STANLEY POCKET DOOR LATCH

[RELATED SECTION 08 71 00]

Model Number: V1951

Dimensions:

Length: 1-1/4"

Width: 1-1/4"

Finish: Satin nickel

Features:

Clear lacquer coating

Fits doors from 1-1/4" to 1-5/8"

Latching mechanism to lock door

Door can be unlocked using a screwdriver

Available: Lowes





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Home : [Stanley-National Hardware Satin Nickel Pocket Door Latch](#)



Stanley-National Hardware Satin Nickel Pocket Door Latch

Item #: 112463 | Model #:V1951

Customers Also Viewed



Stanley-National Hardware Pocket Door Frame...



\$62.95



Gatehouse Satin Nickel Pocket Door Latch

Not Yet Rated

\$12.05



Stanley-National Hardware Brass Pocket Door...

Not Yet Rated

\$12.05



Stanley-National Hardware Oil-Rubbed Bronze...

Not Yet Rated

\$12.05

[Description](#)

[Specifications](#)

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Color / Finish

Satin Nickel and White

Base Material
Finish Family

Brass
Nickel

Size - Measurement (Inches)

2.75

STANLEY 3"X3" SQUARE CORNER RESIDENTIAL HINGE

[RELATED SECTION 08 71 00]

Model Number: 081080

Dimensions:

Length: 3"

Width: 3"

Finish: Brushed nickel plated [14]

Features:

For use on lightweight residential doors in low frequency applications

Non-rising removable flush pin

Five knuckle, full mortise design

Available: Lowes



Residential Hinges

- Decorative Tips & Pins
- Door Closers
- Entry Door
- Spring Hinges
- Accessories
- Adjustable
- Brass Plated Stainless Steel
- Continuous
- Interior Steel Door

STANLEY FatMax
SWIVEL-LOCK® FIXED
BLADE UTILITY KNIFE



[CLICK HERE](#)

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081080 - 3"x3" Bright Nickel Plated(14) Square Corner Residential Hinge

 [Printer Friendly Version](#)

[Email to a friend](#)



Weathergard™

 [View larger](#)

Features and Benefits

- For use on lightweight residential doors in low frequency applications
- Non-rising removable flush pin
- Five knuckle, full mortise design
- Available in square corners (741), 1/4" (6.4mm) radius corners (RD741)
- Available with non-removable pins (NRP) and brass pins (BP)
- ST2H galvanized Weathergard™ finish options

Product Details

| | |
|--------------------|----------------------|
| Length | 3",76.2mm |
| Width | 3",76.2mm |
| Class | 741 |
| Corner Radius | Square |
| Finish | 14 |
| Finish Description | Bright Nickel Plated |

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GATEHOUSE BALL CATCH

[RELATED SECTION 08 71 00]

Model Number: 20482TNXLG

Finish: satin nickel

Available: Lowes

Price: \$5.22





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Home : Search "ball catch" : Gatehouse Satin Nickel Plated Ball Catch



Gatehouse Satin Nickel Plated Ball Catch

Item #: 308683 | Model #:20482TNXLG

★★★★★ Be the first to write a review!

\$5.22

Customers Also Viewed



Prime-Line Brass Surface Mounted Roller Catch

Not Yet Rated

\$2.57



Gatehouse Oil-Rubbed Bronze Ball Catch

Not Yet Rated

\$5.22



Gatehouse Solid Brass Ball Catch

Not Yet Rated

\$7.20



Stanley-National Hardware Satin Nickel Screen...

Not Yet Rated

\$12.57



Gatehouse Satin Nickel Plated Ball Catch

Not Yet Rated

\$5.22

Description

Specifications

Info & Guides

Reviews

Q&A

Color / Finish

Satin Nickel Plated

Finish Family

Nickel

Material

Solid Brass

CONTEMPORARY MODERN FLUSH PULL SIG

[RELATED SECTION 08 71 00]

Model Number: 720

Finish: stainless steel

Available: Contemporary Door Hardware

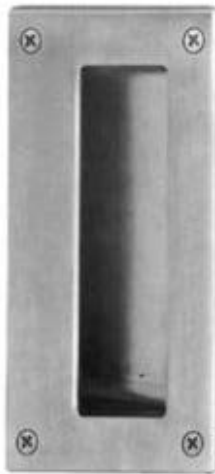
Price: \$38.00



- [Entry sets](#)
- [Contemporary door handles](#)
- [Door pulls](#)
- [Barn door hardware](#)

[Home](#) > **Modern Flush Pull sig 720**

MODERN FLUSH PULL SIG 720



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\$ 38.00 Availability: In stock

Qty:

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OR

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[Add to Compare](#)

Quick Overview

This Modern stainless Steel flush pull with radius corners, supplied with standard fittings.

PRODUCT DESCRIPTION

ADDITIONAL INFORMATION

| | |
|--------|-----------------|
| Finish | Stainless steel |
|--------|-----------------|

GUDEN CONTINUOUS HINGE

[RELATED SECTION 08 71 00]

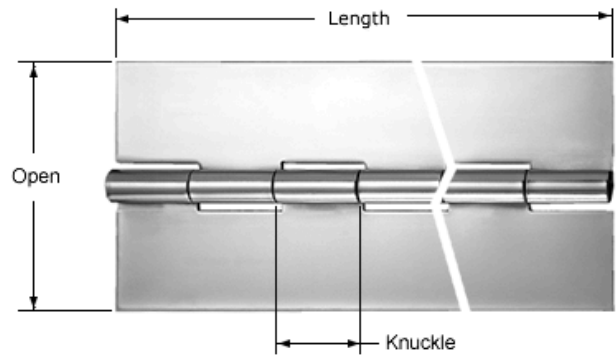
Model Number: SS10090810-96

Dimensions:

Length: 8'

Finish: stainless steel

Available: Gudun



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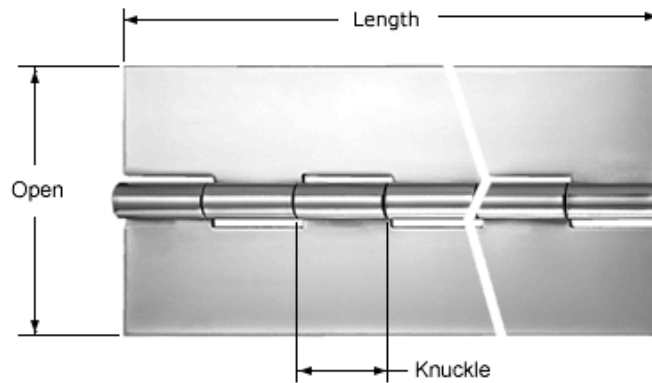
Catches & Latches

Medical / Marine

Lid Supports

SEARCH  or Find by Dimension

Item: SS10090810-96



Quote

Quantity 1: Quantity 2: Quantity 3:

Reference Number: (optional)

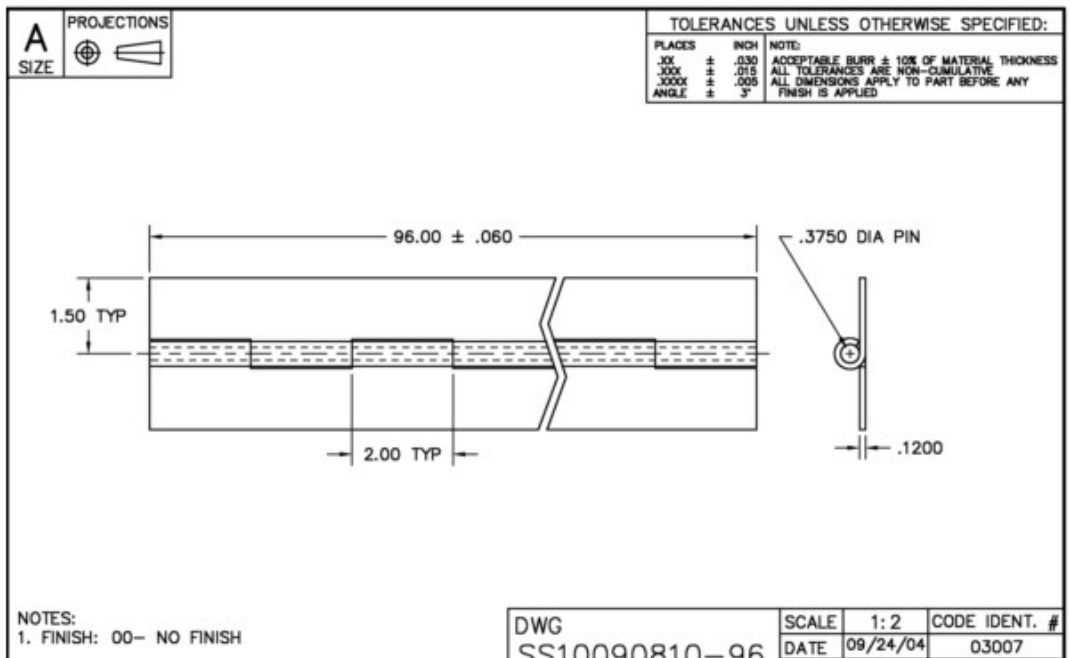
[Quote](#)

Item Detail

Material: SS **Thick:** .120
Pin: .375 **Knuckle:** 2.000
Open: 3.000 **Length:** 96.000

RoHS 

[CAD](#)



S & S SERIES 1300

[RELATED SECTION 08 71 00]

Model Number: 1311x96

Dimensions:

Length: 8'

Finish: stainless steel

Available: S & S



HINGES: STANDARD

At the S&S Hinge Company, we carry the largest standing inventory of continuous hinges anywhere. That means you get the most economical choice with the quickest delivery when you select one of our 200 standard hinges from the chart below.

For blueprints of our standard hinges, click on the S & S Hinge series number in the left column below.

To request a quote on one of our standard hinges, click on the orange S & S Hinge part number below.

| Series | ① Thickness | | Knuckle Length | ② Open Width | | Part # | ③ Metal | | | | | | ④ Length | | | |
|------------|-------------|-----|----------------|--------------|----------------|--------|---------|----|----|----|----|---|----------|----|---|--|
| | in. (mm) | ga. | | in. (mm) | in. (mm) | | S | SS | AL | BA | BP | N | 6' | 8' | | |
| 400 | .035 (0.89) | 20 | .085 (2.16) | 1/4 (6.35) | 3/4 (19.05) | 399P | | | | | | | | | | |
| | | | | | 1-1/16 (26.99) | 400P | | | | | | | | | | |
| | | | | | 1-1/4 (31.75) | 404P | ● | ● | ○ | | | | | ● | ● | |
| | | | | | 1-1/2 (38.10) | 405P | | | | | | | | | | |
| | | | | | 2 (50.80) | 408P | | | | | | | | | | |
| 1000 | .040 (1.02) | 19 | .091 (2.31) | 1/2 (12.70) | 1-1/16 (26.99) | 1001 | | | | | | | | | | |
| | | | | | 1-1/4 (31.75) | 1002 | ● | ● | ● | ● | ● | ● | ● | ○ | | |
| | | | | | 1-1/2 (38.10) | 1003 | | | | | | | | | | |
| | | | | | 2 (50.80) | 1004 | | | | | | | | | | |
| | | | | | 1-1/16 (26.99) | 1101 | | | | | | | | | | |
| 1100 | .050 (1.27) | 18 | .120 (3.05) | 1/2 (12.70) | 1-1/4 (31.75) | 1102 | | | | | | | | | | |
| | | | | | 1-1/2 (38.10) | 1103 | | | | | | | | | | |
| | | | | | 1-3/4 (44.45) | 1104 | ● | ● | ● | | | | | ● | ● | |
| | | | | | 2 (50.80) | 1105 | | | | | | | | | | |
| | | | | | 2-1/2 (63.50) | 1107 | | | | | | | | | | |
| | | | | | 3 (76.20) | 1109 | | | | | | | | | | |
| | | | | | 4 (101.60) | 1113 | | | | | | | | | | |
| 1150 | .060 (1.52) | 16 | .120 (3.05) | 1/2 (12.70) | 1-1/16 (26.99) | 1151 | | | | | | | | | | |
| | | | | | 1-1/4 (31.75) | 1152 | | | | | | | | | | |
| | | | | | 1-1/2 (38.10) | 1153 | | | | | | | | | | |
| | | | | | 1-3/4 (44.45) | 1154 | | | | | | | | | | |
| | | | | | 2 (50.80) | 1155 | ● | ● | ● | | | | | ● | ● | |
| | | | | | 2-1/2 (63.50) | 1157 | | | | | | | | | | |
| | | | | | 3 (76.20) | 1159 | | | | | | | | | | |
| | | | | | 3-1/2 (88.90) | 1161 | | | | | | | | | | |
| 4 (101.60) | 1163 | | | | | | | | | | | | | | | |
| 1200 | .060 (1.52) | 16 | .187 (4.75) | 5/8 (15.88) | 1-1/2 (38.10) | 1203 | | | | | | | | | | |
| | | | | | 1-3/4 (44.45) | 1204 | | | | | | | | | | |
| | | | | | 2 (50.80) | 1205 | ● | ● | ○ | | | | ● | ● | | |
| | | | | | 2-1/2 (63.50) | 1207 | | | | | | | | | | |
| | | | | | 3 (76.20) | 1209 | | | | | | | | | | |
| 4 (101.60) | 1213 | | | | | | | | | | | | | | | |
| 1300 | .070 (1.78) | 14 | .250 (6.35) | 1 (25.40) | 1-1/2 (38.10) | 1303 | | | | | | | | | | |
| | | | | | 2 (50.80) | 1305 | | | | | | | | | | |
| | | | | | 2-1/2 (63.50) | 1307 | ● | ● | ○ | | | | ● | ● | | |
| | | | | | 3 (76.20) | 1309 | | | | | | | | | | |
| | | | | | 3-1/2 (88.90) | 1311 | | | | | | | | | | |
| 4 (101.60) | 1313 | | | | | | | | | | | | | | | |

- = In Stock
- = Special Order
- ◐ = Not available in brite-annealed stainless steel, brass pre-plated steel, or nickel pre-plated steel

8 foot (2438-40mm)
6 foot (1828-80mm)
Nickel Pre-Plated Steel
Brass Pre-Plated Steel
Brite-Annealed Stainless
Aluminum
Stainless Steel
Plain Steel

† Not available in brite-annealed stainless steel, brass pre-plated steel, or nickel pre-plated steel

Our standard continuous hinges are assembled with pins and leaves of the same metal, leaves of equal widths laying flat in the same plane in an open position and having 270 degrees of travel.

80/20 MAGNETIC DOOR CATCH

[RELATED SECTION 08 71 00]

Model Number: 9315

Dimensions:

Length: 2-1/8"

Width: 3/4"

Height: 5/8"

Finish: Aluminum

Features:

Mounts directly to aluminum extrusions with two self-drilling screws

Includes a steel striker plate and [1] 6-32 x .375" FHSCS

Available: Lowes



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Quick Frame Profiles

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Panels & Doors

Panel Retainers

Panel Gasket

Mesh Mounting Hardware

Self Tapping Screws

Adjustable Hinge

Aluminum Hinge

Magnetic Door Catch

Steel Door Handle

Acrylic Panels

Polycarbonate Panels

ABS Haircell Panels

Expanded PVC Panels

Twin Wall Polycarbonate

Alucobond $\frac{1}{2}$ &

Alumalite $\frac{1}{2}$

Expanded Metal Panels

Wire Mesh Panels

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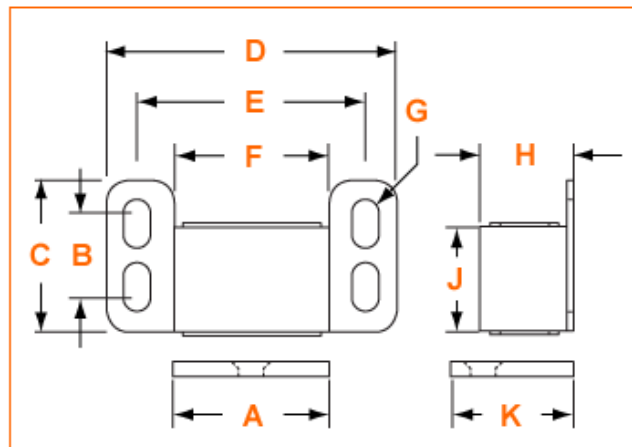
Design Tools

Magnetic Door Catch

- Mounts directly to aluminum extrusions with two self-drilling screws (included)
- Includes a steel striker plate and (1) 6-32 x .375" FHSCS
- Made of aluminum



Magnetic Door Catch Technical Information



| Part No. | A | B | C | D | E | F | G | H | J | K | Weight |
|----------|-------|-------|------|-------|-------|-------|------|------|------|------|-----------|
| 9315 | 1.142 | 1.000 | .650 | 2.087 | 1.673 | 1.224 | .154 | .720 | .909 | .890 | .105 Lbs. |

STANLEY BOX TROLLEY HANGER

[RELATED SECTION 08 78 00]

Model Number: 411020

Location: Living Module

Finish: zinc plated [2C]

Features:

Capacity: 450 lbs [225 lbs per hanger]

Includes 2 hangers, 4 single track slide mount brackets, 2 end caps

Available: Stanley Hardware



Industrial Track Hardware

Accessories

Box Track

Round Track



You are here: [Products](#) >> [Industrial Track Hardware](#) >> [Box Track](#) >> [411020](#)

411020 - Zinc Plated(2C) Box Track Hanger & Bracket Set

[Printer Friendly Version](#)

[Email to a friend](#)

Features and Benefits

- For use with XY2641 track (must be ordered separately)
- Will accommodate loads up to 450 lbs. (225 lbs. per hanger)
- Hangers supplied complete with carriage bolts and hex nuts
- Set Consists of:
 - 2 Hangers (XY2650)
 - 4 Single Track Side Mount Brackets (XY2650-C) (includes bolts and lag screws)
 - 2 End caps (XY2641 - EC)

Product Details

| | |
|--------------------|-------------|
| Base Material | Steel |
| Class | SXY2650 |
| Door Weight (Max.) | 450 |
| Finish | 2C |
| Finish Description | Zinc Plated |



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NATIONAL HARDWARE PLAIN BOX RAIL 10'

[RELATED SECTION 08 78 00]

Model Number: 5114 N104-901

Location: Living Module

Dimensions:

Length: 10' [3048 mm]

Finish: galvanized

Features:

Capacity: 600 lbs

Includes 24" oc brackets

Available: New River Building Supply





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CATEGORY -> HANGERS & RAIL
 SUBCATEGORY -> BOX RAIL COMPONENTS
 PRODUCT TYPE -> BOX RAIL
 CATALOG -> 5114
 ITEM -> **N104-901**



Description

Plain Box Rail 600# Capacity w/24" OC Brackets

| Stock Number | Part Number |
|--------------|-------------|
|--------------|-------------|

| | |
|----------|-----------|
| N104-901 | .51X10.K1 |
|----------|-----------|

| Finish | Package Type |
|--------|--------------|
|--------|--------------|

| | |
|-------------------|------|
| Galvanized finish | 5050 |
|-------------------|------|

| Size | Size 2 |
|------|--------|
|------|--------|

| | |
|-----|--|
| 10' | |
|-----|--|

| Material | UPC |
|----------|-----|
|----------|-----|

| | |
|-------|--------------|
| Steel | 038613104907 |
|-------|--------------|

| Qty Per Package | Qty Per Box | Qty Per Case | Package Type Price Book |
|-----------------|----------------------|--------------------|----------------------------|
| 1 | 4 | | Loose |
| Package (WxHxD) | Box (WxHxL) | Case (WxHxL) | UM |
| x x | 0.00 x 0.00 x 120.00 | 0.00 x 0.00 x 0.00 | LN |
| BCStkNo | Box I25 | Case I25 | Bar Coded 2 |
| N104-901 | 10038613104904 | | |
| Box SWL (each) | SWL Lbs (each) | Unit Weight | Box Weight |
| SWL 600 Lb | 600 | 16.500 | 66.000 |

Disclaimers

NATIONAL HARDWARE PLAIN BOX RAIL 12'

[RELATED SECTION 08 78 00]

Model Number: 5114 N104-950

Location: Living Module

Dimensions:

Length: 12' [3658 mm]

Finish: galvanized

Features:

Capacity: 600 lbs

Includes 24" oc brackets

Available: New River Building Supply





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CATEGORY -> HANGERS & RAIL
 SUBCATEGORY -> BOX RAIL COMPONENTS
 PRODUCT TYPE -> BOX RAIL
 CATALOG -> 5114
 ITEM -> **N104-950**



Description

Plain Box Rail 600# Capacity w/24" OC Brackets

| Stock Number | Part Number |
|--------------|-------------|
|--------------|-------------|

| | |
|----------|-----------|
| N104-950 | .51X12.K1 |
|----------|-----------|

| Finish | Package Type |
|--------|--------------|
|--------|--------------|

| | |
|-------------------|------|
| Galvanized finish | 5050 |
|-------------------|------|

| Size | Size 2 |
|------|--------|
|------|--------|

| | |
|-----|--|
| 12' | |
|-----|--|

| Material | UPC |
|----------|-----|
|----------|-----|

| | |
|-------|--------------|
| Steel | 038613104952 |
|-------|--------------|

| Qty Per Package | Qty Per Box | Qty Per Case | Package Type Price Book |
|-----------------|----------------------|--------------------|----------------------------|
| 1 | 4 | | Loose |
| Package (WxHxD) | Box (WxHxL) | Case (WxHxL) | UM |
| x x | 0.00 x 0.00 x 144.00 | 0.00 x 0.00 x 0.00 | LN |
| BCStkNo | Box I25 | Case I25 | Bar Coded 2 |
| N104-950 | 10038613104959 | | |
| Box SWL (each) | SWL Lbs (each) | Unit Weight | Box Weight |
| SWL 600 Lb | 600 | 19.800 | 79.200 |

Disclaimers

CUSTOM MIRRORS

[RELATED SECTION 08 63 00]

Model Number: 42209

Location: Core Module, Flex Bath

Dimensions:

Width: 30"

Height: 60"

Depth: 1/4"

Features:

Frameless

Polished edges

Cut down to custom sizes needed

Available: Lowes

Price: \$159.79





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Home : [Search "mirror glass polished"](#) : Gardner Glass Products 60"H x 30"W

Rectangular Frameless Bath Mirror with Polished Edges



Gardner Glass Products 60"H x 30"W Rectangular Frameless Bath Mirror with Polished Edges

Item #: 89165 | Model #:42209

★★★★★ Be the first to [write a review!](#)

\$159.79

Hanging hardware sold separately

Customers Also Viewed



Gardner Glass Products 60\"H x 30\"W...

Not Yet Rated

\$165.92



Dreamwalls 60\"H x 36\"W Rectangular Frameless...

Not Yet Rated

\$172.69



Gardner Glass Products 60\"H x 36\"W...

Not Yet Rated

\$179.23



Dreamwalls 72\"H x 42\"W Rectangular Frameless...

Not Yet Rated

\$203.91



Gardner Glass Products 68\"H x 24\"W...

Not Yet Rated

\$154.11

[Description](#)

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Width (Inches)

30.0

Edge Type

Polished

Height (Inches)

60.0

Hardware Included

No

Shape

Rectangle

DIVISION 09 **FINISHES**

5/8" GYPSUM WALLBOARD

[RELATED SECTION 09 29 00]

Model Number: 14211011308

Location: Main House, Flex Space

Dimensions:

Length: 8'

Width: 4'

Depth: 5/8"

Color: White

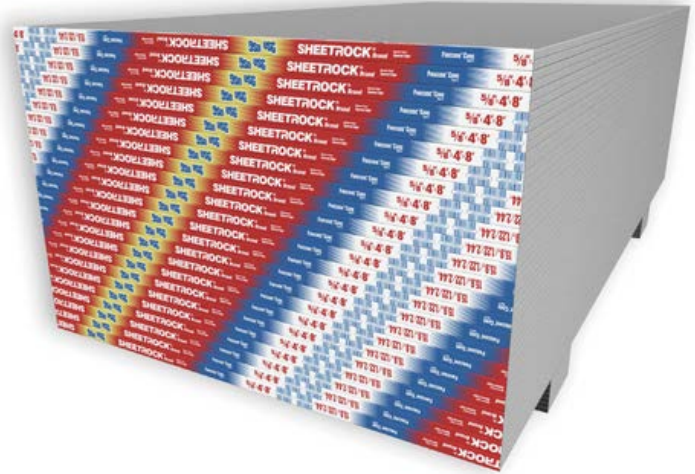
Features:

Facing: paper

Fire resistant

Availability: Lowes

Price: \$8.49





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Home : Search "5/8" gypsum" : SHEETROCK Brand 5/8"T x 8'L x 4'W Drywall



SHEETROCK Brand 5/8\"T x 8'L x 4'W Drywall

Item #: 11737 | Model #:14211011308

★★★★★ Be the first to write a review!

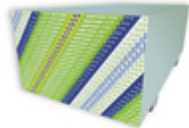
\$8.49

Customers Also Viewed



Lafarge Gypsum
5/8\"T x 8'L x 4'W
Type X...

★★★★★
\$8.49



SHEETROCK Brand
5/8\" x 8' x 4' Tapered
Edge...

Not Yet Rated
\$14.56



American Gypsum
5/8\" x 12' x 4' Fire
Code...

Not Yet Rated
\$19.28

[Description](#)

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| | | | |
|--------------------|-------|--------------------|-----|
| Thickness (Inches) | 0.625 | Mold Resistant | No |
| Facing | Paper | Moisture Resistant | No |
| Fire Rating | N/A | Fire Resistant | Yes |
| Length (Feet) | 8.0 | Moisture Rating | N/A |
| Width (Feet) | 4.0 | Tile Backer | No |

1/2" GYPSUM WALLBOARD

[RELATED SECTION 09 29 00]

Model Number: 1248LLT080000

Location: Flex OM

Dimensions:

Length: 8'

Width: 4'

Depth: 1/2"

Color: White

Features:

Fire resistant

Availability: Lowes

Price: \$6.70





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Weekly Ads | Gift

Home : Search "1/2 gypsum" : Building Supplies : Lafarge Gypsum : Lafarge Gypsum 1/2" x 8' x 4' Drywall



Lafarge Gypsum 1/2" x 8' x 4' Drywall

Item #: 358129 | Model #:1248LLT080000

★★★★★ Be the first to write a review!

\$6.70

Customers Also Viewed



1/2" x 8' x 4'
Moisture-Resistant
Drywall
★★★★★
\$11.47



SHEETROCK Brand
61.7 Lbs. Pail
All-Purpose...
★★★★★
\$14.00



Lafarge Gypsum
3/8" x 8' x 4' Drywall
★★★★★
\$7.00



Lafarge Gypsum
5/8" T x 8' L x 4' W
Type X...
★★★★★
\$8.49



Johns Manville
384" L x 15" W x
3.5" D R-13...
★★★★★
\$9.70

Description

Specifications

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Q&A

Thickness (Inches)

0.5

Mold Resistant

No

Length (Feet)

8.0

Moisture Resistant

No

Width (Feet)

4.0

Fire Resistant

Yes

SERIOUS QUIETROCK SOUNDPROOF DRYWALL

[RELATED SECTION 09 29 00]

Model Number: 510

Location: Bedroom Module

Dimensions:

Length: 9'

Width: 4'

Depth: 1/2"

Weight: 2.25 lbs/ft²

Color: White

Features:

Paper faced gypsum

Sound-absorbing viscoelastic polymer core

Approval Certificates:

UL Listed

Availability: Serious Materials





QuietRock® 510

HIGHER PERFORMANCE, HIGHER RELIABILITY, LOWER COST SOUNDPROOFING SOLUTIONS.



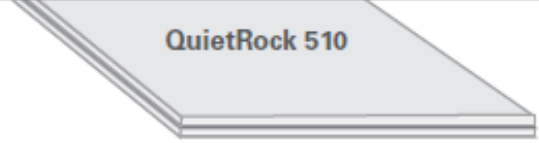
Lowest-Cost Solution for Remodels and Commercial Applications

QuietRock 510 sound damping drywall is the lowest cost, noise reduction wall panel on the market. With a simple score, snap and hang, QuietRock 510 installs and finishes like standard drywall, requiring no special tools.

Score
Snap
Hang

QuietRock 510 Benefits

- Great value, offering solid performance at the lowest cost on the market
- Delivers STC ratings of 47-69
- UL fire-rated (For use in fire rated assemblies)
- Ideal for remodels and upgrades – installs over existing drywall, with no demolition¹
- Continues to reduce noise even when fixtures are installed, such as shelves or lamps
- Only 1/2" thick
- Outperforms other sound damping methods, including soundboard and resilient channel
- Environmentally friendly, lab tested
- Worldwide patents pending



QuietRock 510

QuietRock is a multi-layer engineered drywall panel made of gypsum and viscoelastic sound absorbing polymers.

STC Comparison*

| | |
|----------------------|--------------|
| 1/2" gypsum | 34 |
| 6" CMU | 45 |
| Soundboard | 46 |
| Mass loaded vinyl | 45 |
| QuietRock 510 | 49-53 |

*in single wood stud, 24" OC

Product Specifications

| | |
|----------------------|--|
| Model: | QuietRock 510 |
| Thickness: | 1/2" |
| Weight: | 2.1 lbs/ft ² |
| STC-rated: | 47-69 (ASTM E90) |
| Surface flame: | Class A (ASTM E84) |
| R value: | 0.45 |
| UL-rated assemblies: | U301, U305, U309, U311, U320, U331, U334, U340, U341, U342, U347, U440, U451, U453, U455, U465, U473, U493, V469 |

Product Ordering Codes

| | |
|-----------------|--------------|
| 4' x 8' panel: | QR510STD4X8 |
| 4' x 9' panel: | QR510STD4X9 |
| 4' x 10' panel: | QR510STD4X10 |
| 4' x 12' panel: | QR510STD4X12 |

Applications

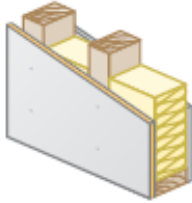
- Remodel
- Retrofit
- Residential

¹ Not recommended for ceiling construction.

For volume purchases. See your local dealer for details.

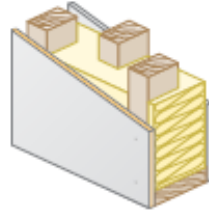
Lowest-Cost Solutions in the Market

Lowest Cost Wall
QuietRock on one side



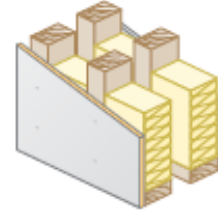
STC: 49

Staggered Stud Wall
QuietRock on one side



STC: 55*

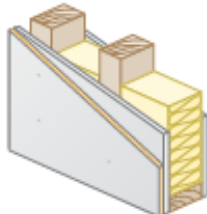
Double Stud Wall
QuietRock on one side



STC: 62*

Retrofit and Remodeling

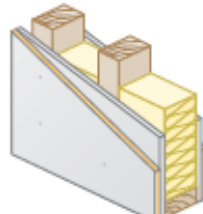
Single Stud Wall
QuietRock on one side of
existing drywall



UL Design #:
U309

STC: 47 - Fire: 1 Hour

Single Stud Wall
QuietRock on both sides of
existing drywall

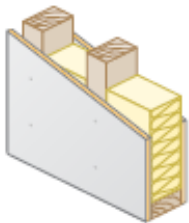


UL Design #:
U309

STC: 53* - Fire: 1 Hour

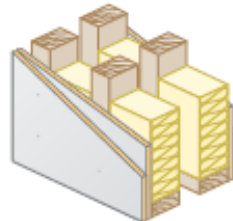
High Performance

Single Stud Wall
QuietRock on both sides



STC: 52

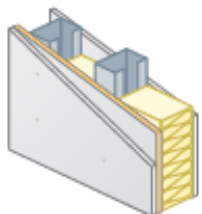
Double Stud Wall
Double layer of QuietRock
on both sides



STC: 71*

Steel - Single layer assemblies with fire ratings and noise reduction

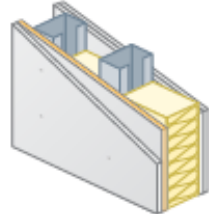
Single Stud Wall
QuietRock under one side of
Type X drywall



UL Design #:
U465, U473

STC: 54 - Fire: 1 Hour

Single Stud Wall
QuietRock under Type X one side
2x Type X other side



UL Design #:
U465, U473

STC: 56 - Fire: 1 Hour

*Estimated

See Acoustic and Fire Assemblies document for more information.

The information contained in this document is for general information purposes only. Features and specifications are subject to change. The diagrams and stated STC ratings listed are intended to serve as a guide. Construction practices have an influence on final STC ratings. Serious Energy cannot guarantee actual STC ratings. Flanking sound patterns, the integrity of the wall, and floor and ceiling construction are important factors in effective sound control.

STCs shown are on 24" wood studs.

MATERIAL SAFETY DATA SHEET
QuietRock 510

| 1. Product And Company Identification | |
|---|---|
| Supplier Serious Energy, LLC 1250 Elko Dr Sunnyvale, CA 94089 Telephone Number: 408-541-8000 FAX Number: 408-715-2560 E-Mail: support@seriousenergy.com Web Site: www.seriousenergy.com | Manufacturer Serious Energy, LLC 1250 Elko Dr Sunnyvale, CA 94089 Telephone Number: 408-541-8000 FAX Number: 408-715-2560 E-Mail: support@seriousenergy.com Web Site: www.seriousenergy.com |
| Supplier Emergency Contacts & Phone Number None Given | Manufacturer Emergency Contacts & Phone Number None Given |
| Issue Date: 10/30/2006 Revision Date: 03/02/2009 Product Name: QuietRock 510 MSDS Number: QR0701-B Product Code: QR-510 Product/Material Uses - Multi-layer sound damping drywall. | |

| 2. Composition/Information on Ingredients | | |
|--|---------------|-------------------------|
| Ingredient Name | CAS Number | Percent of Total Weight |
| Gypsum or Calcium Sulfate Dihydrate | 10101-41-4 | > 80 |
| Cellulose | 9004-34-6 | < 10 |
| Starch | 9005-25-8 | < 3 |
| Acrylate Copolymer | 28063-87-8 | < 3 |
| Rosin Ester | Not Available | < 3 |
| Water | 7732-18-5 | < 3 |
| Paraffin Wax | 8002-74-2 | < 2 |
| Boric Acid | 10043-35-3 | < 1 |
| Potassium Sulfate | 7778-80-5 | < 1 |
| Vermiculite | 01318-00-9 | < 1 |
| Fiberglass Scrim | 65944-17-3 | < 1 |
| Paraffin Oil | 64741-88-4 | < 1 |
| Sodium Carbonate | 497-19-8 | < 1 |
| 2-Propenoic acid, 2-methyl-, polymer with ethyl 2-propenoate | 25212-88-8 | < 1 |
| 2-Pyridinethiol, 1-oxide, sodium salt | 3811-73-2 | < 1 |
| Crystalline Silica | 14808-60-7 | < 0.5 |

EMERGENCY OVERVIEW

CAUTION: Dust generated from cutting, sanding, grinding, machining or sawing may cause irritation of the upper respiratory tract, eyes and skin. Use exposure controls or personal protection methods described in Section 8.

3. Hazards Identification

Likely Routes of Exposure: Skin contact, eye contact, and inhalation.

EFFECTS OF OVEREXPOSURE**Potential Health Effects:**

Eye Hazards – Exposure to airborne dust may cause immediate or delayed mechanical irritation of eyes.

Skin Hazards – Dust and glass fibers may produce dryness, itching, rash and redness. Frequent exposure may have a drying effect on skin. Absorption of boric acid into blood stream through damaged skin may result in erythema or macular rash.

Ingestion Hazards – Not applicable under normal conditions of use. May result in internal discomfort or ill effects if large quantities are swallowed. Large doses of boric acid absorbed into blood may result in erythema, macular rash, diarrhea, dizziness, and CNS effects after 36-72 hours. Ingestion of 5 grams or more boric acid may irritate gastrointestinal system and affect central nervous system.

Inhalation hazards – Exposure to airborne dust generated during the handling or use of the product may cause irritation to nose, throat and upper respiratory system. Boric acid may be absorbed through mucous membranes. Pre-existing upper respiratory and lung diseases may be aggravated. Prolonged inhalation of dust may cause lung disease such as silicosis due to the presence of free crystalline silica. Exposures to respirable crystalline silica have not been documented during normal use of this product. However, good housekeeping practices and industrial hygiene monitoring is recommended when the potential for significant exposure exists.

Medical Conditions Aggravated By Exposure: Because of irritating properties, dust and glass fibers may aggravate preexisting skin, eye, and respiratory conditions.

Target Organs: Skin, eyes and respiratory system

4. First Aid Measures

Eye: Immediately flush eye thoroughly with water for at least 15 minutes. Remove contact lenses (if applicable). Seek medical attention if irritation persists.

Skin: Wash skin with mild soap and plenty of water. Seek medical treatment if irritation develops and persists.

Ingestion: Not known. May result in obstruction and irritation if ingested. Seek medical attention.

Inhalation: Remove to fresh air. Seek medical attention if symptoms persist.

5. Fire Fighting Measures

Flammability Class: Non-Flammable by OSHA/WHMIS criteria.

Products of Combustion: None if below 1450°C. Above 1450°C, gypsum will decompose to calcium oxide with releases of sulfur dioxide and various oxides of carbon.

Fire And Explosion Hazards: None. Not combustible. Above 1450°C, may release product of combustion.

Extinguishing Media: Use the appropriate extinguishing media for the surrounding fire. Dry chemical, foam, water, fog or spray.

Fire Fighting Instructions: None. Although, gypsum panels pose no fire related hazards, firefighters should wear full protective clothing including self contained breathing apparatus. Water can be used to cool and protect exposed material.

6. Accidental Release Measures

- Not applicable, as product is an article composite.
- Collect panels from spillage and if not damaged or contaminated by foreign material, panels may be reclaimed.

General recommendations:

- Use exposure control and appropriate personal protect equipment (See Section 8).
- Pick-up larger pieces to avoid a tripping hazard. Sweep or vacuum remaining material into a waste container for disposal. Use a light water spray to minimize dust generation.
- Dispose of in accordance with applicable federal, state and local regulations.

| |
|--|
| <p>7. Handling And Storage</p> <p>Handling And Storage Precautions</p> <ul style="list-style-type: none"> • Store material in a cool, dry, ventilated area. Do not use when temperatures exceed 125°F. • Stack or store all panels flat to minimize damage and warping. • Do not stack panels too high when storing to minimize the risk of falling. • Panels are heavy and can fall over, causing serious injury or death. Do not stack panels too high. • Utilize proper lifting techniques when moving product and employ mechanical/ergonomic assistance when possible (i.e. move with forklifts, hold in place with lifts) to minimize the risk of back injury. • Scoring and snapping is the method to be used when cutting the panels in order to reduce dust generation. • Use exposure control and appropriate personal protect equipment (See Section 8). |
|--|

| <p>8. Exposure Control/Personal Protection</p> <p>Engineering Controls: The score and snap method of cutting is recommended. Sawing, drilling or machining will produce dust. Use with adequate general and local exhaust ventilation to maintain a dust level below the PEL/TLV.</p> <p>Eye/Face Protection: Safety glasses with side shields or goggles.</p> <p>Skin Protection: Wear protective gloves. Protective clothing to prevent skin contact is recommended.</p> <p>Respiratory Protection: General room ventilation is normally adequate. In case of inadequate ventilation, use a NIOSH-approved respirator for particulates (eg. N95). OSHA’s 29 CFR 1910.134 (Respiratory Protection Standard) must be followed whenever work conditions require respirator use.</p> <p>Ingredient(s) - Exposure Limits:</p> <table border="1"> <thead> <tr> <th>Component</th> <th>OSHA PEL (mg/m3)</th> <th>ACGIH TLV (mg/m3)</th> </tr> </thead> <tbody> <tr> <td>Calcium Sulfate Dihydrate (Gypsum)</td> <td>15^(T) 5^(R)</td> <td>10^(T)</td> </tr> <tr> <td>Cellulose (Paper Fiber)</td> <td>15^(T) 5^(R)</td> <td>10^(T)</td> </tr> <tr> <td>Starch</td> <td>15^(T) 5^(R)</td> <td>10^(T)</td> </tr> <tr> <td>Vermiculite</td> <td>15^(T) 5^(R)</td> <td>5</td> </tr> <tr> <td>Paraffin Wax</td> <td>2 (fume)</td> <td>2 (fume)</td> </tr> <tr> <td>Crystalline Silica (Quartz)</td> <td>30^(T) 10^(R)</td> <td>0.025^(R)</td> </tr> <tr> <td>Fiberglass Scrim, synthetic, vitreous, continuous</td> <td>15^(T) 5^(R)</td> <td>1 f/cc^(R)</td> </tr> </tbody> </table> <p>T - Total Dust R - Respirable Dust</p> | Component | OSHA PEL (mg/m3) | ACGIH TLV (mg/m3) | Calcium Sulfate Dihydrate (Gypsum) | 15 ^(T) 5 ^(R) | 10 ^(T) | Cellulose (Paper Fiber) | 15 ^(T) 5 ^(R) | 10 ^(T) | Starch | 15 ^(T) 5 ^(R) | 10 ^(T) | Vermiculite | 15 ^(T) 5 ^(R) | 5 | Paraffin Wax | 2 (fume) | 2 (fume) | Crystalline Silica (Quartz) | 30 ^(T) 10 ^(R) | 0.025 ^(R) | Fiberglass Scrim, synthetic, vitreous, continuous | 15 ^(T) 5 ^(R) | 1 f/cc ^(R) |
|---|--|-----------------------|-------------------|------------------------------------|---------------------------------------|-------------------|-------------------------|---------------------------------------|-------------------|--------|---------------------------------------|-------------------|-------------|---------------------------------------|---|--------------|----------|----------|-----------------------------|--|----------------------|---|---------------------------------------|-----------------------|
| Component | OSHA PEL (mg/m3) | ACGIH TLV (mg/m3) | | | | | | | | | | | | | | | | | | | | | | |
| Calcium Sulfate Dihydrate (Gypsum) | 15 ^(T) 5 ^(R) | 10 ^(T) | | | | | | | | | | | | | | | | | | | | | | |
| Cellulose (Paper Fiber) | 15 ^(T) 5 ^(R) | 10 ^(T) | | | | | | | | | | | | | | | | | | | | | | |
| Starch | 15 ^(T) 5 ^(R) | 10 ^(T) | | | | | | | | | | | | | | | | | | | | | | |
| Vermiculite | 15 ^(T) 5 ^(R) | 5 | | | | | | | | | | | | | | | | | | | | | | |
| Paraffin Wax | 2 (fume) | 2 (fume) | | | | | | | | | | | | | | | | | | | | | | |
| Crystalline Silica (Quartz) | 30 ^(T) 10 ^(R) | 0.025 ^(R) | | | | | | | | | | | | | | | | | | | | | | |
| Fiberglass Scrim, synthetic, vitreous, continuous | 15 ^(T) 5 ^(R) | 1 f/cc ^(R) | | | | | | | | | | | | | | | | | | | | | | |

| |
|---|
| <p>9. Physical And Chemical Properties</p> <p>Appearance: Paper covered panel with off white core</p> <p>Odor: Low odor</p> <p>Physical State: Solid</p> <p>Specific Gravity: 50-55 lbs/ft³</p> <p>Evaporation: Not applicable</p> <p>Flash Point: None</p> <p>Auto Ignition Temperature: Not combustible</p> <p>Decomposition Temp: 1450°C</p> <p>Solubility in Water (% by wt.): 0.241gs/100cc</p> |
|---|

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|---|
| <p>10. Stability And Reactivity</p> <p>Stability: Stable.</p> <p>Conditions to Avoid: High relative humidity will cause panels to deteriorate.</p> <p>Hazardous Polymerization: Will not occur.</p> |
|---|

SERIOUS ENERGY

Incompatible Materials: Reaction with strong acids will generate carbon dioxide.

Hazardous Decomposition Products: Above 1450°C, gypsum will decompose to calcium oxide with releases of sulfur dioxide and various oxides of carbon.

11. Toxicological Information

In general, no adverse health effects are expected if product is handled as recommended with suitable precautions for designated uses.

EFFECTS OF ACUTE EXPOSURE

Component Analysis

| Ingredient | LD ₅₀ (oral) | LC ₅₀ |
|---------------------------------------|--|--|
| Calcium sulfate dihydrate | 2,000 mg/Kg (female rats) | Not available |
| Sodium Carbonate | 6600 mg/Kg (mouse) 4090 mg/Kg (rat) | 1200 mg/m ³ /2H (mouse) 2300 mg/m ³ /2H (rat) |
| 2-Pyridinethiol, 1-oxide, sodium salt | 870 mg/Kg (mouse) | Not available |
| Boric Acid | 2660 mg/Kg (rat) | Not available |
| Crystalline Silica (Quartz) | Not available | Not available |

EFFECTS OF CHRONIC EXPOSURE

Chronic Effects: Hazardous by OSHA/WHMIS criteria. Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling.

Carcinogenicity: Hazardous by OSHA/WHMIS criteria

Mutagenicity; Reproductive Effects; Teratogenicity; Embryotoxicity; Respiratory Sensitization; Skin Sensitization: Not hazardous by OSHA/WHMIS Criteria

Toxicologically Synergistic Materials: Not Available.

Target Organs: Lungs

Ingredient

Crystalline silica (quartz)

ACGIH – A2 – Suspected human carcinogen

IARC – 1 – The agent is carcinogenic to humans

NTP – 1 – Known to be carcinogens

Toxicologically Synergistic Materials: Not Available.

12. Ecological Information

Aquatic Toxicity: Unknown. Not believed to be toxic.

Other Environmental Information: Unknown.

13. Disposal Considerations

Dispose of according to federal, state and local government regulations. Recycle if possible.

RCRA Information - Product is not a RCRA Hazardous Waste.

14. Transport Information

Proper Shipping Name - Not regulated.

15. Regulatory Information

SARA Title III: Not listed under Sections 302, 304 and 313. This product contains substances classified as a delayed (chronic) health hazard under Sections 311 – 312.

OSHA: Dust and potential respirable crystalline silica generated during product use may be hazardous.

Ingredient(s) – Canadian Regulatory Information: Crystalline silica & Boric Acid: WHMIS Classification D2A.

Sodium Carbonate.

All components of this product are included in the Canadian Domestic Substances List (DSL).

European Union (EU) Regulatory Information: All components in this product are in compliance with European Inventory of Existing Commercial Chemical Substances (EINECS).

| |
|---|
| European Union Risk Phrases – none required |
| European Union Safety Phrases - none required |
| Toxic Substances Control ACT (TSCA): All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30. |
| California Safe Drinking Water and Toxic Enforcement Act (Prop. 65): Respirable crystalline silica is known to the state of California to cause cancer. |

| | | |
|---|-----------------|-------------|
| 16. Other Information | | |
| Global Inventories: | | |
| Ingredient | Canada | USA |
| | DSL/NDSL | TSCA |
| Calcium sulfate dihydrate | DSL | Yes |
| Crystalline Silica (Quartz) | DSL | Yes |
| NFPA Rating | | |
| Health: 1 | | |
| Fire: 0 | | |
| Reactivity: 0 | | |
| HMIS Rating | | |
| Health: 1 | | |
| Fire: 0 | | |
| Reactivity: 0 | | |
| Personal Protection: E | | |
| WHMIS Classification(s) | | |
| Class D2A – Carcinogenicity | | |
| Class D2A – Chronic Toxic Effects | | |
| Reference Documentation | | |
| The following were the primary references used in the creation of this MSDS: | | |
| <ul style="list-style-type: none"> • Canadian Center for Occupational Health & Safety (CCINFO) MSDS Database • Guide to Occupational Exposure Values, ACGIH 2002-2003 • U.S. National Library of Medicine Hazardous Substance Databank (HSDB) • Registry Toxic Effects of Chemical Substances (RTECS) | | |

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|--|
| Disclaimer |
| Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user’s intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purposes(s). |
| Serious Energy, Inc. |

SERIOUS QUIETSEAL

[RELATED SECTION 09 29 00]

Location: Bedroom Module

Weight: 14.1 lbs/gallon

Color: yellow

Features:

Layer thickness: 1/16"

Drying time: remains soft

Engageability: -10°F

Storage temperature: 40-100°F, do not freeze

Availability: Serious Materials



Highly resilient sound damping sealant

QuietSeal is ideal for use with QuietRock®, QuietWood®, QuietPutty® and QuietGlue® in construction projects, as it is specifically designed for sound isolation and for interior use between joints. QuietSeal is highly resilient, withstanding any amount of movement normally encountered in partitions. It can be applied as a sealant to all clean concrete, gypsum, plaster, steel, wood and aluminum surfaces without priming.

QuietSeal Benefits

- Excellent for use with QuietRock, QuietWood, QuietPutty and QuietGlue in construction projects
- High quality sound isolating sealant/caulk
- Maintains high STC ratings
- Remains permanently soft and tacky
- Environmentally friendly, lab tested
- Tested in accordance with ASTM C639, Type IId; ASTM D2202; sag testing
- Tested in accordance with ASTM D925; will not deteriorate painted surface
- Tested in accordance with ASTM D750; weatherability

Product Specifications

| | |
|-------------------|-------------------------------|
| Model: | QuietSeal 350 |
| Color: | Yellow |
| Solid content: | 91 wt % |
| Weight: | 14.1 lbs/gallon |
| Volume shrinkage: | < 18% |
| Layer thickness: | 1/16" |
| Drying time: | Remains soft |
| Engageability: | -10° F |
| Threshold: | TLV 200 ppm |
| Storage temp: | 40° - 100° F Do not freeze |



Product Application

QuietSeal should be applied between track or runner, walls, floors and ceilings, as well as between panel edges and contact surfaces. The number of beads required will vary from one to two in most applications depending on the size of the potential airgap. Special problem areas may require a premolded, loose-cell filler or additional sealant between track and drywall at top and bottom edges, according to design specifications.

QuietSeal is designed strictly for interior use between joints. It should not be applied at the sight-line, where dirt pick-up is likely, except where molding or joint taping will conceal it. A non-skinning sealant such as QuietSeal cannot be painted over. QuietSeal is easily removed from unwanted surfaces with any paint thinner.

Applications

- Multi-family
- Commercial
- Hotel rooms
- Conference rooms
- Home theaters

MATERIAL SAFETY DATA SHEET

QuietSeal

| 1. Product And Company Identification | |
|--|--|
| <p>Supplier Serious Energy, LLC 1250 Elko Dr Sunnyvale, CA 94089</p> <p>Telephone Number: 408-541-8000 FAX Number: 408-715-2560 E-Mail: support@seriousenergy.com Web Site: www.seriousenergy.com</p> | <p>Manufacturer Serious Energy, LLC 1250 Elko Dr Sunnyvale, CA 94089</p> <p>Telephone Number: 408-541-8000 FAX Number: 408-715-2560 E-Mail: support@seriousenergy.com Web Site: www.seriousenergy.com</p> |
| <p>Supplier Emergency Contacts & Phone Number Safety Officer – 408-541-8000</p> | <p>Manufacturer Emergency Contacts & Phone Number Safety Officer – 408-541-8000</p> |
| <p>Issue Date: 07/17/2008 Revision Date: 04/26/2011</p> <p>Product Name: QuietSeal, Butyl/Polybutylene Rubber Compound MSDS Number: QS0302-C</p> <p>Product Code: QS-350 Product/Material Uses – Acoustical sealant.</p> | |

| 2. Composition/Information on Ingredients | | |
|---|---------------|-------------------------|
| Ingredient Name | CAS Number | Percent of Total Weight |
| Filler | Not Available | < 70 |
| Butyl Rubber & Plasticizers | Not Available | < 25 |
| Aliphatic Naphtha | Not Available | < 15 |

| 3. Hazards Identification |
|---|
| <p>Likely Routes of Exposure: Skin contact, eye contact, ingestion and inhalation.</p> <p>Potential Health Effects:</p> <p>Eye Hazards – Contact may cause discomfort to the eyes leading to irritation or burning sensation, redness and swelling of the conjunctiva.</p> <p>Skin Hazards – Prolonged or repeated exposure may cause dermatitis, folliculitis or oil acne.</p> <p>Ingestion Hazards – Not applicable under normal conditions of use. May cause nausea, vomiting or irritation to intestinal tract.</p> <p>Inhalation hazards – May cause headache, dizziness, or irritation to respiratory system.</p> |

| 4. First Aid Measures |
|--|
| <p>Eye: Immediately flush eye thoroughly with water for at least 15 minutes. Remove contact lenses (if applicable).</p> <p>Skin: Wash affected area with hand cleaner followed by soap and water. Contact physician if irritation, rash or other disorders develop.</p> <p>Ingestion: Not known. Do not induce vomiting. Never give anything by mouth to an unconscious victim. Consult a physician or poison control center immediately.</p> <p>Inhalation (of dust): Leave area immediately. Avoid further exposure.</p> |

| 5. Fire Fighting Measures |
|--|
| <p>Flash Point: Non-flammable by WHIMS criteria in consumer commodity packaging of 1 liter or less.</p> <p>Fire And Explosion Hazards: No fire or explosion hazard. May evolve irritating and toxic decomposition under fire conditions.</p> <p>Extinguishing Media: Use the appropriate extinguishing media for the surrounding fire, such as water, carbon dioxide, and dry chemical foam. If water fog is ineffective, use CO2 or dry chemical or foam. Water may be sprayed on closed containers to minimize pressure buildup conditions of flammability, high heat and or ignition sources eg. Sparks, flame, etc., may ignite vapor in confined spaces.</p> <p>Fire Fighting Instructions: Firefighters should wear full protective clothing including self contained breathing apparatus.</p> |

SERIOUS ENERGY

6. Accidental Release Measures

- Use exposure control and appropriate personal protect equipment (See Section 8).
- Maintain proper ventilation.
- Avoid spark or open flame.
- Scoop up and transfer to suitable container for disposal, absorb with clay.
- Dispose of in accordance with applicable federal, state and local regulations.

7. Handling And Storage

Handling And Storage Precautions

- Use exposure control and appropriate personal protect equipment (See Section 8).
- Store in sealed containers under normal warehouse conditions below 30°C.
- Keep away from oxidizing agents or reactive substances.
- For industrial use only, keep out of reach of children.
- Handle in compliance with normal hygienic practices.

8. Exposure Control/Personal Protection

Skin Protection: Avoid repeated skin contact. Wear suitable gloves. Impervious gloves (eg. Vinyl) should be used to avoid skin contact. Launder clothing and gloves as needed.

Respiratory Protection: General room ventilation is normally adequate and preferred. No respirator required under normal conditions of use. If suspecting overexposure, use an approved organic vapor respirator.

Eye Protection: Not necessary under normal conditions of use. If eye contact is likely, wear safety glasses with side shields.

9. Physical And Chemical Properties

Appearance: Light yellow paste.

Odor: Naphtha odor.

Specific Gravity: 1.4.

Solubility in Water: Insoluble.

Boiling Point: > 400°C.

Melting Point: None.

Vapor Pressure (mmHg): 5.

Percent Volatile By Volume: 10

Volatile Organic Compounds (VOCs): 170.6 g/l

10. Stability And Reactivity

Stability: Stable under normal conditions of use.

Hazardous Polymerization: Will not occur.

Incompatible Materials: oxidizing agents.

Hazardous Decomposition Products: unknown.

11. Toxicological Information

No toxicological data available for this product.

12. Ecological Information

Other Environmental Information: Not Available.

13. Disposal Considerations

Dispose of product in accordance with federal, state and local environmental control regulations.

14. Transport Information

Proper Shipping Name: - Not regulated.

15. Regulatory Information

| |
|---|
| SARA Title III: |
| OSHA: |
| Ingredient(s) – Canadian Regulatory Information: |
| European Union (EU) Regulatory Information: All components in this product are in compliance with European Inventory of Existing Commercial Chemical Substances (EINECS). |
| Toxic Substances Control ACT (TSCA): All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30. |
| California Safe Drinking Water and Toxic Enforcement Act (Prop. 65): |

| |
|--|
| 16. Other Information |
| <u>NFPA Rating</u> Health: 1 Fire: 0 Reactivity: 1 |
| <u>HMIS Rating</u> Health: 1 Fire: 0 Reactivity: 1 |
| <u>Reference Documentation</u> The following were the primary references used in the creation of this MSDS: <ul style="list-style-type: none">• Canadian Center for Occupational Health & Safety (CCINFO) MSDS Database• Guide to Occupational Exposure Values, ACGIH 2002-2003• U.S. National Library of Medicine Hazardous Substance Databank (HSDB)• Registry Toxic Effects of Chemical Substances (RTECS) |

| |
|---|
| <u>Disclaimer</u> |
| Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purposes(s). Serious Materials, Inc. |

SERIOUS QUIETPUTTY

[RELATED SECTION 09 29 00]

Model Number: 380

Location: Bedroom Module

Dimensions:

Length: 7"

Width: 7"

Depth: 1/8"

Weight: 6 oz/pad

Color: blue/green

Features:

Unit Size: 10 pads/box

Availability: Serious Materials



QuietPutty® 380

HIGHER PERFORMANCE, HIGHER RELIABILITY, LOWER COST SOUNDPROOFING SOLUTIONS.



Easy to use acoustical putty - Fire-rated to UL 1479

QuietPutty is a fire-rated, moldable putty, designed to maintain the performance of acoustically rated walls with penetrations such as electrical outlets, HVAC ducts, water hookups and cables. QuietPutty is clean, easy to use and requires no tools.

QuietPutty Benefits

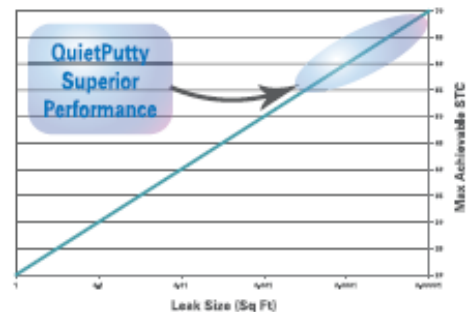
- One hour fire-rated to UL 1479
- Adheres to most construction materials for a high quality seal
- Asbestos free and odorless
- Provides a draft and cold smoke seal
- Minimal shrinkage and will not dry out
- Noncorrosive to metal and plastics
- Environmentally friendly, lab tested
- Patents pending



Product Specifications

| | |
|------------|---------------------|
| Model: | QuietPutty 380 |
| Color: | Blue/Green |
| Thickness: | 1/8" |
| Weight: | 6 oz/pad |
| Size: | 7 x 7 in/pad |
| Density: | 1oz/in ³ |
| Unit size: | 10 pads/box |
| STC-rated: | 47-63 (ASTM E90) |

Using QuietPutty to Prevent Leaks Maximizes Acoustic Performance



Maximum Achievable STC Rating with an Acoustical Leak in a 100 Square Foot Wall

Application of the Product

No tools required. Simply adhere putty using your hands to the back of outlet box or target area.



Applications

- Electrical outlet boxes
- Telecomm outlet boxes
- Electrical switches
- Plumbing hookups

MATERIAL SAFETY DATA SHEET
QuietPutty

| | |
|---|---|
| 1. Product And Company Identification | |
| Supplier Serious Energy, LLC 1250 Elko Dr Sunnyvale, CA 94089 Telephone Number: 408-541-8000 FAX Number: 408-715-2560 E-Mail: support@seriousenergy.com Web Site: www.seriousenergy.com | Manufacturer Serious Energy, LLC 1250 Elko Dr Sunnyvale, CA 94089 Telephone Number: 408-541-8000 FAX Number: 408-715-2560 E-Mail: support@seriousenergy.com Web Site: www.seriousenergy.com |
| Supplier Emergency Contacts & Phone Number None Given | Manufacturer Emergency Contacts & Phone Number None Given |
| Issue Date: 04/26/2005 Revision Date: 09/24/2009 Product Name: QuietPutty MSDS Number: QS0300-C Product Code: QuietPutty Product/Material Uses – Acoustical sealant for outlet boxes. | |

| | | |
|--|-------------------|--------------------------------|
| 2. Composition/Information on Ingredients | | |
| Ingredient Name | CAS Number | Percent of Total Weight |
| Non Hazardous Ingredients | Proprietary | 100 |

| |
|---|
| 3. Hazards Identification |
| <p>Potential Health Effects: Not considered hazardous under normal conditions of use.</p> <p>Eye Hazards – None under normal conditions of use.</p> <p>Skin Hazards – Non-irritating to skin.</p> <p>Ingestion Hazards – None under normal conditions of use.</p> <p>Inhalation hazards – None under normal conditions of use.</p> |

| |
|--|
| 4. First Aid Measures |
| <p>Eye: Not applicable due to physical form.</p> <p>Skin: Wash with mild soap and plenty of water. Seek medical treatment if irritation (redness, rash, swelling) develops due to personal allergies.</p> <p>Ingestion: In the event of ingestion, seek medical attention. Do not induce vomiting. No serious acute effects anticipated.</p> <p>Inhalation: Not applicable under normal conditions of use.</p> |

| |
|---|
| 5. Fire Fighting Measures |
| <p>Flash Point: 227°C.</p> <p>Fire And Explosion Hazards: Normal combustion forms carbon dioxide and water vapor. Incomplete combustion may produce carbon monoxide.</p> <p>Extinguishing Media: Use the appropriate extinguishing media for the surrounding fire, such as water spray, carbon dioxide, and dry chemical foam.</p> <p>Fire Fighting Instructions: No unusual fire or explosion hazards. Water can be used to cool and protect exposed material. Firefighters should wear full protective clothing including self contained breathing apparatus.</p> |

6. Accidental Release Measures

- Use exposure control and appropriate personal protect equipment (See Section 8).
- Maintain proper ventilation.
- Pick up released product with appropriate implements and place in container for disposal.
- Dispose of in accordance with applicable federal, state and local regulations.

7. Handling And Storage**Handling And Storage Precautions**

- Use exposure control and appropriate personal protect equipment (See Section 8).
- Keep away from flames.
- For industrial use only, keep out of reach of children.
- Handle in compliance with normal hygienic practices.

8. Exposure Control/Personal Protection

Engineering Controls: Not applicable under normal conditions of use.

Eye/Face Protection: None required.

Skin Protection: Cotton or leather protective gloves should be used if excessive skin contact is likely.

Respiratory Protection: General room ventilation is normally adequate. No respirator required.

9. Physical And Chemical Properties

Appearance: Blue-green semi-solid (putty).

Odor: Slight odor.

Specific Gravity: 1.73.

Solubility in Water: Negligible.

Boiling Point: None.

Melting Point: None.

Evaporating Rate: None

10. Stability And Reactivity

Stability: Stable.

Conditions to Avoid: Fire and temperatures over 625°F (329°C).

Incompatible Materials: May react with strong oxidizing materials.

Hazardous Decomposition Products: Normal combustion forms carbon dioxide and water vapor. Incomplete combustion may produce carbon monoxide.

11. Toxicological Information

Routes of Entry: Skin contact, ingestion

Effects of Acute Exposure to Product: This material is not expected to be toxic by ingestion or skin contact

Effects of Chronic Exposure to Product: Not established

Exposure Limits: Not Applicable

Sensitization to Product: Not Applicable

Teratogenicity: Not Applicable

Mutagenicity: Not Applicable

Irritancy of Product: Not Applicable

Carcinogenicity: Not Applicable

Reproductive Toxicity: Not Applicable

Synergistic Products: Not Applicable

LD50 of Ingredients: Not Available

LC50 of Ingredients: Not Available

12. Ecological Information

Other Environmental Information: Because of its low water solubility and degree of toxicity, this material is believed to not present any environmental problems.

13. Disposal Considerations

- Regular garbage disposal in approved dumping area.
- RCRA Information** - Product is not a RCRA Hazardous Waste.

14. Transport Information

Proper Shipping Name - Not regulated.

15. Regulatory Information

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed

Canadian Regulatory Information: This product is not classified as hazardous under WHMIS.

Ingredient(s) – Canadian Regulatory Information:

WHMIS – Ingredient Disclosure List.

European Inventory of Existing Commercial Chemical Substances (EINECS):

All components in this product are in compliance with EINECS.

Toxic Substances Control ACT (TSCA): All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30.

16. Other Information**NFPA Rating**

Health: 0

Fire: 0

Reactivity: 0

HMIS Rating

Health: 0

Fire: 0

Reactivity: 0

Reference Documentation

The following were the primary references used in the creation of this MSDS:

- Canadian Center for Occupational Health & Safety (CCINFO) MSDS Database
- Guide to Occupational Exposure Values, ACGIH 2002-2003
- U.S. National Library of Medicine Hazardous Substance Databank (HSDB)
- Registry Toxic Effects of Chemical Substances (RTECS)

Disclaimer

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purposes(s).

Serious Materials, Inc.

SCHLUTER KERDI

[RELATED SECTION 09 34 00]

Model Number: KERDI 200/5M

Location: Core Module Bath

Dimensions:

Length: 16'-5"

Width: 3'-3"

Depth: 8 mil

Finish: orange

Features:

Area: 54 ft²

Availability: Grainger





Product Item Numbers



8.1 Schluter®-KERDI (waterproofing membrane)

| Item No. | Width | Length | Area | Thickness |
|---------------|-------------|---------------|---|-----------|
| KERDI 200/5M | 3' 3" - 1 m | 16' 5" - 5 m | 54 ft ² - 5 m ² | 8 mil |
| KERDI 200/10M | 3' 3" - 1 m | 33' - 10 m | 108 ft ² - 10 m ² | 8 mil |
| KERDI 200/20M | 3' 3" - 1 m | 65' 7" - 20 m | 215 ft ² - 20 m ² | 8 mil |
| KERDI 200 | 3' 3" - 1 m | 98' 5" - 30 m | 323 ft ² - 30 m ² | 8 mil |



8.1 Schluter®-KERDI-BAND (waterproofing strip)

| Item No. | Width | Length | Thickness |
|------------------|------------------|---------------|-----------|
| KEBA 100/125/5M | 5" - 12.5 cm | 16' 5" - 5 m | 4 mil |
| KEBA 100/125/10M | 5" - 12.5 cm | 33' - 10 m | 4 mil |
| KEBA 100/185/5M | 7-1/4" - 18.5 cm | 16' 5" - 5 m | 4 mil |
| KEBA 100/250/5M | 10" - 25 cm | 16' 5" - 5 m | 4 mil |
| KEBA 100/125 | 5" - 12.5 cm | 98' 5" - 30 m | 4 mil |
| KEBA 100/185 | 7-1/4" - 18.5 cm | 98' 5" - 30 m | 4 mil |
| KEBA 100/250 | 10" - 25 cm | 98' 5" - 30 m | 4 mil |



8.1 Schluter®-KERDI-FLEX (waterproofing strips for use above movement joints)

| Item No. | Width | Length | Thickness |
|-------------|--------------|---------------|-----------|
| FLEX 125/5M | 5" - 12.5 cm | 16' 5" - 5 m | 12 mil |
| FLEX 250/5M | 10" - 25 cm | 16' 5" - 5 m | 12 mil |
| FLEX 125/30 | 5" - 12.5 cm | 98' 5" - 30 m | 12 mil |
| FLEX 250/30 | 10" - 25 cm | 98' 5" - 30 m | 12 mil |



8.1 Schluter®-KERDI-KERECK-F (pre-formed corners)

| Item No. | Thickness | Packaging |
|----------------|-----------|--------------------|
| KERECK / FI 2 | 4 mil | 2 Inside corners |
| KERECK / FI 10 | 4 mil | 10 Inside corners |
| KERECK / FA 2 | 4 mil | 2 Outside corners |
| KERECK / FA 10 | 4 mil | 10 Outside corners |



8.1 Schluter®-KERDI-SEAL-PS (pipe seal with over-moulded rubber gasket)

| Item No. | Pipe nipple opening diam. | Thickness | Packaging |
|-------------|---------------------------|-----------|-----------|
| KMS185/12 | 1/2" - 12.5 mm | 4 mil | 1 unit |
| KMS185/20 | 3/4" - 20 mm | 4 mil | 1 unit |
| KMS10185/12 | 1/2" - 12.5 mm | 4 mil | 10 units |
| KMS10185/20 | 3/4" - 20 mm | 4 mil | 10 units |



8.1 Schluter®-KERDI-SEAL-MV (mixing valve seal with over-moulded rubber gasket)

| Item No. | Mixing valve opening diam. | Thickness | Packaging |
|----------------|----------------------------|-----------|-----------|
| KMSMV114 | 4-1/2" - 114 mm | 4 mil | 1 unit |
| KMSMV10235/114 | 4-1/2" - 114 mm | 4 mil | 10 units |



Schluter®-KERDI-TROWEL

| Item No. | Notch size | Packaging |
|----------|---------------------------|-----------|
| TRL-KER6 | 1/8" x 1/8" - 3 mm x 3 mm | 6 units |



Schluter®-KERDI-FIX

| Item No. | Cartridge Volume |
|------------------|---------------------------|
| KERDIFX + color* | 1/8" x 1/8" - 3 mm x 3 mm |

***Color Codes**

BW (Bright white) G (Grey)

To complete the item number, add the color code (e.g., KERDIFX / BW).

HARDWOOD STRIP FLOORING

[RELATED SECTION 09 64 29]

Model Number: 5CHARWOPF

Location: Main House

Dimensions:

Length: 84"

Width: 5"

Features:

15 year warranty

Availability: national chain lumberyards and online hardwood floor stores





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5" Prefinished Solid White Oak Flooring - Character Grade



[View Enlarge](#)

Product Features

| | |
|-------------------|--------------------------------|
| Model | 5CHARWOPF |
| Width | 5" |
| Thickness | 3/4" |
| Length | See Menu Below for Lengths |
| Edge Profile | Microbeveled Edges/Ends |
| Warranty | 25 Year Warranty |
| Install Method | Nail Down or Staple Down |
| Milling Profile | Tongue & Groove |
| Finish | UV Cured Aluminum Oxide Finish |
| Grade | Character Grade |
| Wood Specie | White Oak |
| Special Features | Long Lengths |
| Construction Type | Solid Hardwood Flooring |

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Description

This gorgeous 5" Wide Plank Character Grade White Oak flooring comes in **extra long planks that range from 2 Feet up to 10 Feet long with an average length of 4 1/2 Feet**. This factory finished flooring displays beautiful character marks including sound knots, mineral marks, and other natural characters that guarantee a wood floor that looks natural and real.

The longer lengths that we offer add value to your purchase, setting your floor apart from most other products out there that come in standard lengths from 1 to 7 feet, or even shorter.



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ICI PREP AND PRIME SEALER

[RELATED SECTION 09 93 23]

Model Number: 1060-1200

Location: Main House and Flex Space interior walls

Color: white

Solids:

Volume: 34%

Weight: 48%

Features:

Dry Time: 30-60 mins.

Coverage per Gallon: 400²ft.

Availability: Boone Paint & Interiors





Paints

PREP & PRIME™ VAPOR BARRIER Interior Water-Based Primer Sealer 1060-1200

SPECIFICATION DATA

A premium quality latex primer sealer and vapor barrier for interior walls and ceilings. It reduces loss of interior moisture through the walls to help maintain insulation efficiency and guard against exterior paint adhesion failures caused by condensation. Moisture and Heat Loss - Every home contains moist air (water vapor) that, in the proper proportion, provides a healthy atmosphere. But under winter conditions, when the inside/outside temperatures differ drastically, the moisture indoors passes through interior walls and condenses within the stud space as it seeks the colder exterior side. The moisture may fill the pockets or voids in insulation, increasing the flow of heat, reducing its insulation value. Insulation must be dry to function efficiently.

Keeping water vapor inside the home will help reduce heat loss and guard against moisture damage. Vapor barrier systems can help to provide this protection. Therefore, to help keep moisture inside apply PREP & PRIME Vapor Barrier Primer Sealer to interior walls and ceilings that contact the outside of any unheated areas. To be effective, a product must have a perm rating of less than 1.0, as set forth by the Federal Housing Administration Minimum Property Standards.

PREP & PRIME Vapor Barrier is specifically formulated to provide a perm rating of 0.6 when applied at a coverage rate of 400 sq ft/gal (10 m²/L) to smooth surfaces. The perm rating for PREP & PRIME Vapor Barrier Primer Sealer compares favorably with a typical 2 mil sheet of medium density polyethylene. PREP & PRIME Vapor Barrier Primer Sealer applies and cleans up with the ease of latex wall paint. It may be topcoated with latex or alkyd paints in any desired finish.

FEATURES

- Vapor barrier
- Easy application
- Excellent enamel hold-out
- Fast drying
- High Hiding
- Easy soap and water clean-up
- Low odor
- Low VOC
- Performance alternate for Federal Paint Specification TT-P-650D

COMPOSITION

- Styrene-Butadiene Resin
- Titanium Dioxide and Extender Pigments
- Not manufactured with lead or mercury containing materials.

DESCRIPTION

Color:

White (tintable, limit 4 oz/gal)

Finish:

Flat

Clean-up Solvent:

Soap and water

Density:

10.5 lbs/gal (1.26 kg/L)

VOC:

0.71 lbs/gal (85 g/L)

Solids:

Volume - 34% ± 1%

Weight - 48% ± 1%

Practical Coverage:

Apply at 400 sq ft/gal (10 m²/L).

Actual coverage may vary depending on substrate and application method.

Flame Spread Rating:

Class A (0-25) over non-combustible surfaces

Flash Point:

None

Dry Time 77°F (25°C) & 50% RH:

To touch - 30-60 minutes

To recoat - 2 hours

Shelf Life:

1 year minimum - unopened





HAZARDS IDENTIFICATION (ANSI Section 3)

Primary route(s) of exposure : Inhalation, skin contact, eye contact, ingestion.
Effects of overexposure :

Inhalation : Irritation of respiratory tract, lungs. Prolonged inhalation may lead to mucous membrane irritation, dizziness and/or lightheadedness, headache, nausea, coughing, central nervous system depression.

Skin contact : Irritation of skin.

Eye contact : Irritation of eyes. Prolonged or repeated contact can cause conjunctivitis, tearing of eyes, redness of eyes.

Ingestion : Ingestion may cause dizziness and/or lightheadedness, headache, nausea, gastro-intestinal disturbances, intoxication.

Medical conditions aggravated by exposure : Eye, skin, respiratory disorders.

FIRST-AID MEASURES (ANSI Section 4)

Inhalation : Remove to fresh air. Restore and support continued breathing. Get emergency medical attention. Have trained person give oxygen if necessary. Get medical help for any breathing difficulty. Remove to fresh air if inhalation causes eye watering, headaches, dizziness, or other discomfort.

Skin contact : Wash thoroughly with soap and water. If any product remains, gently rub petroleum jelly, vegetable or mineral/baby oil onto skin. Repeated applications may be needed. Remove contaminated clothing. Wash contaminated clothing before re-use.

Eye contact : Flush immediately with large amounts of water, especially under lids for at least 15 minutes. If irritation or other effects persist, obtain medical treatment.
Ingestion : If swallowed, obtain medical treatment immediately.

FIRE-FIGHTING MEASURES (ANSI Section 5)

Fire extinguishing media : Dry chemical or foam water fog. Carbon dioxide. Closed containers may burst if exposed to extreme heat or fire. May decompose under fire conditions emitting irritant and/or toxic gases. In closed tanks, water or foam may cause frothing or eruption.

Fire fighting procedures : Water may be used to cool and protect exposed containers. Firefighters should use full protective clothing, eye protection, and self-contained breathing apparatus.

Hazardous decomposition or combustion products : Carbon monoxide, carbon dioxide.

ACCIDENTAL RELEASE MEASURES (ANSI Section 6)

Steps to be taken in case material is released or spilled : Comply with all applicable health and environmental regulations. Eliminate all sources of ignition. Ventilate area. Spills may be collected with absorbent materials. Evacuate all unnecessary personnel. Place collected material in proper container. Spilled material is extremely slippery. Complete personal protective equipment in proper use during cleanup. Large spills - shut off leak if safe to do so. Dike and contain spill. Pump to storage or salvage vessels. Use absorbent to pick up excess residue. Keep salvageable material and rinse water out of sewers and water courses. Small spills - use absorbent to pick up residue and dispose of properly.

HANDLING AND STORAGE (ANSI Section 7)

Handling and storage : Store below 100f (38c). Keep from freezing. Keep container tightly closed in a well-ventilated area.

Other precautions : Use only with adequate ventilation. Do not take internally. Keep out of reach of children. Avoid contact with skin and eyes, and breathing of vapors. Wash hands thoroughly after handling, especially before eating or smoking. Keep containers tightly closed and upright when not in use. Empty containers may contain hazardous residues.

EXPOSURE CONTROLS/PERSONAL PROTECTION (ANSI Section 8)

Respiratory protection : Control environmental concentrations below applicable exposure standards when using this material. When respiratory protection is determined to be necessary, use a NIOSH/MSHA (Canadian z94.4) Approved elastomeric sealing- surface facepiece respirator outfitted with organic vapor cartridges and paint spray (dust/mist) prefilters. Determine the proper level of protection by conducting appropriate air monitoring. Consult 29CFR1910.134 For selection of respirators (Canadian z94.4).

Ventilation : Provide dilution ventilation or local exhaust to prevent build-up of vapors.

Personal protective equipment : Eye wash, safety shower, safety glasses or goggles. Impervious gloves, impervious clothing.

STABILITY AND REACTIVITY (ANSI Section 10)

Under normal conditions : Stable see section 5 fire fighting measures

Materials to avoid : Oxidizers, acids, hydrogen fluoride.

Conditions to avoid : Elevated temperatures, contact with oxidizing agent, freezing, sparks, open flame.

Hazardous polymerization : Will not occur

TOXICOLOGICAL INFORMATION (ANSI Section 11)

Supplemental health information : Contains a chemical that may be absorbed through skin. Notice - reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. This product will generate formaldehyde under acidic conditions. Workplace exposure to formaldehyde should be evaluated when this product is used in acidic conditions to assess whether the actual airborne concentrations exceed any of the action levels defined in the OSHA standard. Prolonged inhalation of mica may cause pneumoconiosis. Symptoms may include a progressive dry cough, shortness of breath on exertion, decreased chest expansion, weakness and weight loss. Other effects of overexposure may include toxicity to liver, kidney, blood.

Carcinogenicity : In a lifetime inhalation study, exposure to 250 mg/m3 titanium dioxide resulted in the development of lung tumors in rats. These tumors occurred only at dust levels that overwhelmed the animals' lung clearance mechanisms and were different from common human lung tumors in both type and location. The relevance of these findings to humans is unknown but questionable. The international agency for research on cancer (IARC) has classified titanium dioxide as possibly carcinogenic to humans (group 2b) based on inadequate evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.

Reproductive effects : No reproductive effects are anticipated

Mutagenicity : No mutagenic effects are anticipated

Teratogenicity : No teratogenic effects are anticipated

ECOLOGICAL INFORMATION (ANSI Section 12)

No ecological testing has been done by ICI paints on this product as a whole.

The information contained herein is based on data available at the time of preparation of this data sheet which ICI Paints believes to be reliable. However, no warranty is expressed or implied regarding the accuracy of this data. ICI Paints shall not be responsible for the use of this information, or of any product, method or apparatus mentioned and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and the health and safety of your employees and the users of this material.
Complies with OSHA hazard communication standard 29CFR1910.1200.

DISPOSAL CONSIDERATIONS

(ANSI Section 13)

REGULATORY INFORMATION

(ANSI Section 15)

Waste disposal : Dispose in accordance with all applicable regulations. Avoid discharge to natural waters.

As of the date of this MSDS, all of the components in this product are listed (or are otherwise exempt from listing) on the TSCA inventory. This product has been classified in accordance with the hazard criteria of the CPR (controlled products regulations) and the MSDS contains all the information required by the CPR.

Physical Data

(ANSI Sections 1, 9, and 14)

| Product Code | Description | Wt. / Gal. | VOC gr. / ltr. | % Volatile by Volume | Flash Point | Boiling Range | HMSIS | DOT, proper shipping name |
|--------------|--|------------|----------------|----------------------|-------------|---------------|-------|-----------------------------------|
| 1060-1200 | prep & prime vapor barrier latex primer/sealer | 10.47 | 93.47 | 66.03 | none | 212-453 | 210 | paint ** protect from freezing ** |

Ingredients

Product Codes with % by Weight (ANSI Section 2)

| Chemical Name | Common Name | CAS. No. | 1060-1200 |
|--|--|------------|-----------|
| ethanol, 2-(2-butoxyethoxy)- | diethylene glycol monobutyl ether | 112-34-5 | 1-5 |
| mica | mica | 12001-26-2 | 10-20 |
| titanium oxide | titanium dioxide | 13463-67-7 | 5-10 |
| propanoic acid, 2-methyl-, monoester with 2,2,4-trimethyl-1,3-pentanediol | texanol | 25265-77-4 | 1-5 |
| butanedioic acid, methylene-, polymer with 1,3-butadiene, ethenylbenzene and 2-methyl-2-propenoic acid | carboxy modified styrene butadiene polymer | 52831-07-9 | 10-20 |
| kieselguhr | diatomaceous earth, uncalcined | 61790-53-2 | 1-5 |
| water | water | 7732-18-5 | 40-50 |

Chemical Hazard Data

(ANSI Sections 2, 8, 11, and 15)

| Common Name | CAS. No. | ACGIH-TLV | | | OSHA-PEL | | | S.R. Std. | | | | | | | | |
|-----------------------------------|------------|------------|----------|----------|------------|----------|----------|-----------|----------|----------|----|---|---|---|---|---|
| | | 8-Hour TWA | STEL | C | 8-Hour TWA | STEL | C | S | S2 | S3 | CC | H | M | N | I | O |
| diethylene glycol monobutyl ether | 112-34-5 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | y | n | n | n | n |
| mica | 12001-26-2 | 3 mg/m3 | not est. | not est. | 3 mg/m3 | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| titanium dioxide | 13463-67-7 | 10 mg/m3 | not est. | not est. | 10 mg/m3 | not est. | not est. | not est. | not est. | not est. | n | n | n | n | y | n |
| texanol | 25265-77-4 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| diatomaceous earth, uncalcined | 61790-53-2 | not est. | not est. | not est. | 6 mg/m3 | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |

Footnotes:

C=Ceiling - Concentration that should not be exceeded, even instantaneously.

S=Skin - Additional exposure over and above airborne exposure, may result from skin absorption.

n/a=not applicable
ppm=parts per million
mg/m3=milligrams per cubic meter
Sup Cont=Supplier Confidential

S2=Sara Section 302 EHS
S3=Sara Section 313 Chemical
S.R. Std.=Supplier Recommended Standard

H=Hazardous Air Pollutant, M=Marine Pollutant
P=Pollutant, S=Severe Pollutant
Carcinogenicity Listed By:
N=NTP, I=IARC, O=OSHA, y=yes, n=no

BENJAMIN MOORE INTERIOR LATEX PAINT

[RELATED SECTION 09 93 23]

Model Number: W626 4X

Location: Core Module Walls and Bedroom Closet Doors

Finish: Eggshell

Color: Gray

Solids:

Volume: 35%

Weight: 45%

Features:

Dry time: 2 hrs.

Coverage per gallon: 400-450²ft.

Availability: Boone Paint & Interiors





ben[®]

PREMIUM INTERIOR LATEX
EGGSHELL FINISH W626

Features

- Attractive eggshell finish
- Painted surfaces can be washed after two weeks
- Easy application
- Self priming on most surfaces
- Soap and water clean-up
- Premium hide and leveling
- Low odor
- Low VOC's

Recommended For

Ideal for applications where a fast drying, high hiding, durable coating is required. Recommended for new or previously painted wallboard, masonry, and primed or previously painted plaster, wood or metal. For use on interior walls and ceilings.


General Description

An acrylic blended latex eggshell coating designed for application to a wide variety of interior surfaces. Produces a highly durable, washable finish with excellent hiding.

Limitations

- Do not paint when temperature of air and surface is below 50° F (10° C).

Product Information

| | | | |
|--|---|------------------------------------|-------------------------|
| Colors:—Standard: White (01) | | | |
| —Tint Bases: 1X, 2X, 3X, & 4X. Tint Bases only with Gennex [®] Waterborne Colorant. | | | |
| —Special Colors: Contact your Benjamin Moore & Co. representative. | | | |
| Certification: | | | |
| VOC compliant in all regulated areas | | | |
| Master Painter Institute MPI # 44, 44 X-Green | | | |
| Class A (0-25) over non-combustible surfaces when tested in accordance with ASTM E-84 | | | |
|  | | | |
| Based on independent, third-party testing, the Green Promise [®] designation certifies that this product meets or exceeds each standard shown in the following chart. | | | |
| LEED [®] | Green Seal [™] GS-11 2010 | MPI Green Performance [™] | Greenguard [®] |
| YES | YES | YES | YES |
| Greenguard Children & Schools [®] | CHPS (Collaborative for High Performance Schools) | VOC (any color) | |
| YES | YES | 45 g/l | |

Technical Assistance

Available through your local authorized independent Benjamin Moore[®] retailer. For the location of the retailer nearest you, call 1-800-828-2623, see www.benjaminmoore.com, or consult your local Yellow Pages.

| Technical Data [Ⓞ] | Pastel Base |
|--|---------------------------|
| Vehicle Type | Proprietary Acrylic Latex |
| Pigment Type | Titanium Dioxide |
| Volume Solids | 35% |
| Coverage per Gallon at Recommended Film Thickness | 400 – 450 Sq. Ft. |
| Recommended Film Thickness | |
| – Wet | 3.8 mills |
| – Dry | 1.3 mills |
| Depending on surface texture and porosity. Be sure to estimate the right amount of paint for the job. This will ensure color uniformity and minimize the disposal of excess paint. | |
| Dry Time @ 77° F (25° C) @ 50% RH | |
| – To Touch | 2 Hours |
| – To Recoat | 4 Hours |
| Painted surfaces can be washed after two weeks. High humidity and cool temperatures will result in longer dry, recoat and service times | |
| Dries By | Evaporation, Coalescence |
| Viscosity | 92 ± 3 KU |
| Flash Point | None |
| Gloss / Sheen | Eggshell (15-25 @ 85°) |
| Surface Temperature at Application | |
| – Min. | 50° F |
| – Max | 90° F |
| Thin With | See Chart |
| Clean Up Thinner | Clean Water |
| Weight Per Gallon | 11.0 lbs |
| Storage Temperature | |
| – Min. | 40° F |
| – Max | 90° F |
| Volatile Organic Compounds (VOC) | |
| 45 Grams / Liter | .37 LBS / Gallon |

[Ⓞ]Reported values are for Pastel Base. Contact Benjamin Moore & Co. for values of other bases or colors.



Material Safety Data Sheet

Revision Date: 25-Jan-2011

Revision Number: 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name **ben INTERIOR ACRYLIC LATEX EGGSHELL**
Product Code **W626**
Product Class **WATER THINNED PAINT**
Color **All**

Manufacturer **Benjamin Moore & Co.**
101 Paragon Drive
Montvale, NJ 07645
Phone: 201-573-9600
www.benjaminmoore.com

Emergency Telephone Number(s)
CHEMTREC: 800-424-9300

2. COMPOSITION INFORMATION ON COMPONENTS

Hazardous Components

| Chemical Name | CAS-No | Weight % (max) |
|---------------------------|------------|----------------|
| Titanium dioxide | 13463-67-7 | 25 |
| Limestone | 1317-85-3 | 20 |
| Nepheline syenite | 37244-96-5 | 10 |
| Silica, amorphous | 7631-86-9 | 5 |
| Acetic acid ethenyl ester | 108-05-4 | 0.5 |

3. HAZARDS IDENTIFICATION

Emergency Overview

Vapors may be irritating to eyes, nose, throat, and lungs. May cause skin irritation and/or dermatitis.

Appearance liquid

Odor little or no odor

Potential Health Effects

Principal Routes of Exposure Eye contact, skin contact and inhalation.

Acute Effects

Eyes May cause slight irritation.
Skin Substance may cause slight skin irritation.
Inhalation May cause irritation of respiratory tract.
Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic Effects Repeated contact may cause allergic reactions in very susceptible persons.

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions None known

HMIS Health: 1* Flammability: 0 Reactivity: 0 PPE: -

HMIS Legend

0 - Minimal Hazard

1 - Slight Hazard

2 - Moderate Hazard

3 - Serious Hazard

4 - Severe Hazard

* - Chronic Hazard

X - Consult your supervisor or S.O.P. for "Special" handling instructions.

Note: The PPE rating has intentionally been left blank. Choose appropriate PPE that will protect employees from the hazards the material will present under the actual normal conditions of use.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, Benjamin Moore & Co., has chosen to provide them. HMIS® ratings are to be used only in conjunction with a fully implemented HMIS® program by workers who have received appropriate HMIS® training. HMIS® is a registered trade and service mark of the NPCA. HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

4. FIRST AID MEASURES

| | |
|---------------------------|---|
| General Advice | No hazards which require special first aid measures. |
| Eye Contact | Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. |
| Skin Contact | Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. |
| Inhalation | Move to fresh air. If symptoms persist, call a physician. |
| Ingestion | Clean mouth with water and afterwards drink plenty of water. Consult a physician if necessary. |
| Notes To Physician | Treat symptomatically |

5. FIRE-FIGHTING MEASURES

| | |
|--|--|
| Suitable Extinguishing Media | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Protective Equipment And Precautions For Firefighters | As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. |
| Specific Hazards Arising From The Chemical | Closed containers may rupture if exposed to fire or extreme heat. |

| | |
|----------------------------------|----------------|
| Sensitivity To Mechanical Impact | No |
| Sensitivity To Static Discharge | No |
| Flash Point Data | |
| Flash Point (°F) | Not applicable |
| Flash Point (°C) | Not applicable |
| Flash Point Method | Not applicable |
| Flammability Limits In Air | |
| Lower Explosion Limit | Not applicable |
| Upper Explosion Limit | Not applicable |

NFPA Health: 1 Flammability: 0 Instability: 0 Special: Not Applicable

NFPA Legend

- 0 - Not Hazardous
- 1 - Slightly
- 2 - Moderate
- 3 - High
- 4 - Severe

The ratings assigned by Benjamin Moore & Co. are only suggested ratings, the contractor/employer has ultimate responsibilities for NFPA ratings where this system is used.

Additional information regarding the NFPA rating system is available from the National Fire Protection Agency (NFPA) at www.nfpa.org.

6. ACCIDENTAL RELEASE MEASURES

| | |
|---------------------------|---|
| Personal Precautions | Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. |
| Environmental Precautions | Prevent further leakage or spillage if safe to do so. |
| Methods For Clean-Up | Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal. |
| Other Information | None known |

7. HANDLING AND STORAGE

| | |
|----------|--|
| Handling | Avoid contact with skin, eyes and clothing. Avoid breathing vapors, spray mists or sanding dust. In case of insufficient ventilation, wear suitable respiratory equipment. |
| Storage | Keep container tightly closed. Keep out of the reach of children. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits

Hazardous Components

| Chemical Name | ACGIH | OSHA |
|---------------------------|-------------------------------|--|
| Titanium dioxide | 10 mg/m ³ - TWA | 15 mg/m ³ - TWA total |
| Limestone | N/E | 15 mg/m ³ - TWA total 5 mg/m ³ - TWA |
| Nepheline syenite | N/E | 5 mg/m ³ - TWA (nuisance dust) |
| Silica, amorphous | N/E | - (80)/(% SiO ₂) mg/m ³ TWA 20 mppcf - TWA |
| Acetic acid ethenyl ester | 10 ppm - TWA 15 ppm - STEL | N/E |

Legend

ACGIH - American Conference of Governmental Industrial Hygienists Exposure Limits

OSHA - Occupational Safety & Health Administration Exposure Limits

N/E - Not Established

Engineering Measures

Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment**Eye/Face Protection**

Safety glasses with side-shields.

Skin Protection

Protective gloves and impervious clothing.

Respiratory Protection

In case of insufficient ventilation wear suitable respiratory equipment.

Hygiene Measures

Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|----------------------------|-------------------|
| Appearance | liquid |
| Odor | little or no odor |
| Density (lbs/gal) | 9.5 - 11.4 |
| Specific Gravity | 1.1 - 1.4 |
| pH | Not available |
| Evaporation Rate | Not available |
| Vapor Pressure | Not available |
| Vapor Density | Not available |
| Wt. % Solids | 40 - 60 |
| Vol. % Solids | 30 - 45 |
| Wt. % Volatiles | 40 - 60 |
| Vol. % Volatiles | 55 - 70 |
| VOC Regulatory Limit (g/L) | < 50 |
| Boiling Point (°F) | 212 |
| Boiling Point (°C) | 100 |
| Freezing Point (°F) | 32 |
| Freezing Point (°C) | 0 |
| Flash Point (°F) | Not applicable |
| Flash Point (°C) | Not applicable |
| Flash Point Method | Not applicable |
| Upper Explosion Limit | Not applicable |
| Lower Explosion Limit | Not applicable |

10. STABILITY AND REACTIVITY

| | |
|------------------------------------|--|
| Chemical Stability | Stable under normal conditions. |
| Conditions To Avoid | Prevent from freezing |
| Incompatible Materials | No materials to be especially mentioned. |
| Hazardous Decomposition Products | None under normal use. |
| Possibility Of Hazardous Reactions | None under normal conditions of use. |

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product

No information available

Component

Titanium dioxide

LD50 Oral: > 24000 mg/kg (Rat)

LD50 Dermal: > 10000 mg/m³ (Rabbit)

LC50 Inhalation (Dust): > 6.82 mg/L (Rat, 4 hr.)

Limestone

LD50 Oral: 6,450 mg/kg (Rat) vendor data

Sensitization: No sensitizing effects known.

Nepheline syenite

Sensitization: No sensitizing effects known.

Silica, amorphous

LD50 Oral: > 10000 mg/kg (Rat)

LD50 Dermal: 2,000 mg/kg (Rabbit)

LC50 Inhalation (Dust): > 2 mg/L

Acetic acid ethenyl ester

LD50 Oral: 2900 mg/kg (Rat)

LD50 Dermal: 2335 mg/kg (Rabbit)

LC50 Inhalation (Vapor): 114000 mg/m³ (Rat, 4 hr.)

Chronic Toxicity

Carcinogenicity

The information below indicates whether each agency has listed any ingredient as a carcinogen:

| Chemical Name | ACGIH | IARC | NTP | OSHA Carcinogen Listed |
|---------------------------|--|--------------------------------------|-----|------------------------------|
| Titanium dioxide | | 2B - Possible Human Carcinogen | | Listed |
| Acetic acid ethenyl ester | A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans | 2B - Possible Human Carcinogen | | Listed |

- Although IARC has classified titanium dioxide as possibly carcinogenic to humans (2B), their summary concludes: "No significant exposure to titanium dioxide is thought to occur during the use of products in which titanium dioxide is bound to other materials, such as paint."

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

IARC - International Agency for Research on Cancer

NTP - National Toxicity Program

OSHA - Occupational Safety & Health Administration

12. ECOLOGICAL INFORMATION

Ecotoxicity Effects

Product

Acute Toxicity to Fish

No information available

Acute Toxicity to Aquatic Invertebrates

No information available

Acute Toxicity to Aquatic Plants

No information available

Component

Acute Toxicity to Fish

Titanium dioxide

LC50: >1000 mg/L (Fathead Minnow - 96 hr.)

Acute Toxicity to Aquatic Invertebrates

No information available

Acute Toxicity to Aquatic Plants

No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose of in accordance with federal, state, and local regulations. Dry, empty containers may be recycled in a can recycling program. Local requirements may vary, consult your sanitation department or state-designated environmental protection agency for more disposal options.

14. TRANSPORT INFORMATION

DOT Not regulated

ICAO / IATA Not regulated

IMDG / IMO Not regulated

15. REGULATORY INFORMATION

International Inventories

United States TSCA Yes - All components are listed or exempt.
Canada DSL Yes - All components are listed or exempt.

Federal Regulations

SARA 311/312 hazardous categorization

| | |
|-----------------------------------|-----|
| Acute Health Hazard | No |
| Chronic Health Hazard | Yes |
| Fire Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Reactive Hazard | No |

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

| <u>Chemical Name</u> | <u>CAS-No</u> | <u>Weight % (max)</u> |
|---------------------------|---------------|-----------------------|
| Acetic acid ethenyl ester | 108-05-4 | 0.5 |

This product may contain trace amounts of (other) SARA reportable chemicals. Contact Benjamin Moore & Co. for further information.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product contains the following HAPs:

| <u>Chemical Name</u> | <u>CAS-No</u> | <u>Weight % (max)</u> |
|---------------------------|---------------|-----------------------|
| Acetic acid ethenyl ester | 108-05-4 | 0.5 |

This product may contain trace amounts of (other) HAPs chemicals. Contact Benjamin Moore & Co. for further information.

State Regulations

California Proposition 65

This product may contain small amounts of materials known to the state of California to cause cancer or reproductive harm.

State Right-to-Know

| Chemical Name | Massachusetts | New Jersey | Pennsylvania | Louisiana | Rhode Island |
|---------------------------|----------------------|-------------------|---------------------|------------------|---------------------|
| Titanium dioxide | X | X | X | | X |
| Limestone | X | X | X | | X |
| Silica, amorphous | X | X | X | | |
| Acetic acid ethenyl ester | X | X | X | X | X |

Legend

X - Listed

16. OTHER INFORMATION

WARNING! If you scrape, sand, or remove old paint, you may release lead dust. LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a NIOSH approved respirator to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead.

Prepared By Product Stewardship Department
Benjamin Moore & Co.
360 Route 206 - P.O. Box 4000
Flanders, NJ 07836
866-690-1961

Issuing Date 23-May-2001

Revision Date: 25-Jan-2011

Revision Summary Not available

Disclaimer

The information contained herein is presented in good faith and believed to be accurate as of the effective date shown above. This information is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determination of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. Any use of this data and information must be determined by the user to be in accordance with applicable federal, provincial, and local laws and regulations.

End of MSDS

GLIDDEN ULTRA-HIDE 150 INTERIOR EGGSHELL PAINT

[RELATED SECTION 09 91 23]

Model Number: 1412-0110V

Location: Main House ceiling and walls

Finish: eggshell

Color: ruffled feathers

Solids:

Volume: 32%

Weight: 45%

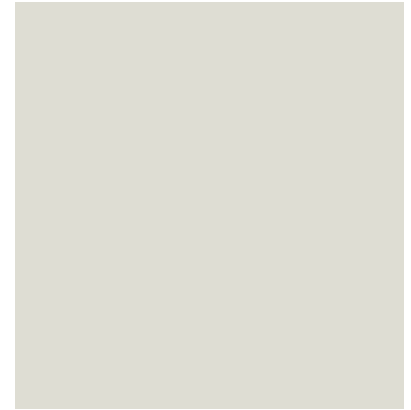
Features:

Dry time: 30-60 min.

Flame spreading rating: class A

Shelf Life: 1 year unopened

Availability: Boone Paint & Interiors





ULTRA-HIDE® 150 Interior Eggshell Paint 1412-XXXXV

Previously GLIDDEN™ ULTRA-HIDE®
Interior Eggshell Wall & Trim Enamel

DESCRIPTION

GLIDDEN PROFESSIONAL™ ULTRA-HIDE® 150 paint is a high-hiding, easy-to-apply interior wall and trim paint that delivers excellent burnish resistance and durability. Recommended for all commercial and property maintenance applications where a uniform, durable interior finish is required.

CERTIFICATIONS

| AS OF 7/1/2009, COMPLIES WITH | |
|-------------------------------|-----|
| MPI# | 44 |
| LEED | Yes |
| CHPS | Yes |
| GREENGUARD | No |
| AIM | Yes |
| OTC/LADCO | Yes |
| CARB | Yes |
| SCAQMD | Yes |

PERFORMANCE DATA

| CHARACTERISTIC: | RESULTS: |
|---|-------------------------------|
| Airless Spray Touch-Up* | ★★★★★★☆☆ |
| Dry Hide* | ★★★★★★☆☆ |
| Burnish Resistance* | ★★★★★★☆☆ |
| Shim Scrub Resistance* | ★★★★★★☆☆ |
| Washability* | ★★★★★★☆☆ |
| Sag Resistance | 14-18 mils wet |
| Air and Substrate Application Temperature | 50° F (10° C) - 90° F (32° C) |
| Service Temperature Limits | 200° F (93° C) |
| Storage Temperature | 40° (4° C) F - 95° F (35° C) |

*Performance ratings are based on product comparisons to other products in that sheen range, performed at 77° F (25° C) 50% RH. Rating scale is from 1-10, 10 being the highest rating.

COMPOSITION

- Vinyl-Acrylic Resin
- Titanium Dioxide and Extender Pigments
- Not manufactured with lead or mercury containing materials.

SPECIFICATION

Color:

White, ready mix & custom colors

Clean-up Solvent:

Soap and water

Finish: Eggshell

Sheen: 10 - 35 units @ 85°

Gloss: 5 - 12 units @ 60°

Density:

10.38 lbs/gal (1.25 kg/L)

Solids:

Volume - 32% +/- 1%

Weight - 45% +/- 1%

VOC:

50 g/L (0.42 lbs/gal) maximum

Refer to MSDS for regulatory VOC content of complete product line

Theoretical Coverage @ 1 mil dry:

508 sq ft/gal (12 m²/L)

Practical Coverage:

Apply at 350-400 sq ft/gal (9-10 m²/L).

Actual coverage may vary depending on substrate and application method.

Recommended Film Thickness:

4.0 - 4.6 mils wet

1.3 - 1.5 mils dry

Airless Spray Application:

Pressure - 2000 psi

Tip - .015" - .019"

Dry Time 77°F (25°C) & 50% RH:

To touch - 30-60 minutes

To recoat - 2-4 hours

Flame Spread Rating:

Class A (0-25) on non-combustible surfaces

Flash Point:

None

Shelf Life:

1 year minimum - unopened



www.gliddenprofessional.com

9 FINISHES
PAINTING (09900)

HAZARDS IDENTIFICATION (ANSI Section 3)

Primary route(s) of exposure : Inhalation, skin contact, eye contact, ingestion.

Effects of overexposure :

Inhalation : Irritation of respiratory tract. Prolonged inhalation may lead to mucous membrane irritation, headache, nausea, chest pain, coughing, difficulty of breathing, severe lung irritation or damage, pneumoconiosis.

Skin contact : Irritation of skin.

Eye contact : Irritation of eyes.

Ingestion : Ingestion may cause mouth and throat irritation, gastro-intestinal disturbances.

Medical conditions aggravated by exposure : Eye, skin, respiratory disorders, lung disorders, asthma-like conditions.

FIRST-AID MEASURES

(ANSI Section 4)

Inhalation : Remove to fresh air. Restore and support continued breathing. Get emergency medical attention. Have trained person give oxygen if necessary. Get medical help for any breathing difficulty. Remove to fresh air if inhalation causes eye watering, headaches, dizziness, or other discomfort.

Skin contact : Wash thoroughly with soap and water. If any product remains, gently rub petroleum jelly, vegetable or mineral/baby oil onto skin. Repeated applications may be needed. Remove contaminated clothing. Wash contaminated clothing before re-use.

Eye contact : Flush immediately with large amounts of water, especially under lids for at least 15 minutes. If irritation or other effects persist, obtain medical treatment.

Ingestion : If swallowed, obtain medical treatment immediately.

FIRE-FIGHTING MEASURES

(ANSI Section 5)

Fire extinguishing media : Dry chemical or foam water fog. Carbon dioxide. Closed containers may burst if exposed to extreme heat or fire. In closed tanks, water or foam may cause frothing or eruption.

Fire fighting procedures : Water may be used to cool and protect exposed containers. Firefighters should use full protective clothing, eye protection, and self-contained breathing apparatus.

Hazardous decomposition or combustion products : Carbon monoxide, carbon dioxide, acrylic monomers, Sodium oxide.

ACCIDENTAL RELEASE MEASURES

(ANSI Section 6)

Steps to be taken in case material is released or spilled : Comply with all applicable health and environmental regulations. Eliminate all sources of ignition. Ventilate area. Spills may be collected with absorbent materials. Evacuate all unnecessary personnel. Place collected material in proper container. Spilled material is extremely slippery. Small spills - use absorbent to pick up residue and dispose of properly.

HANDLING AND STORAGE

(ANSI Section 7)

Handling and storage : Store below 100F (38C). Keep from freezing.

Other precautions : Use only with adequate ventilation. Do not take internally. Keep out of reach of children. Avoid contact with skin and eyes, and breathing of vapors. Wash hands thoroughly after handling, especially before eating or smoking. Keep containers tightly closed and upright when not in use. Avoid conditions which result in formation of inhalable particles such as spraying or abrading (sanding) painted surfaces. If such conditions cannot be avoided, use appropriate respiratory protection as directed under exposure controls/personal protection.

EXPOSURE CONTROLS/PERSONAL PROTECTION (ANSI Section 8)

Respiratory protection : Control environmental concentrations below applicable exposure standards when using this material. When respiratory protection is determined to be necessary, use a NIOSH/MSHA (Canadian z94.4) Approved elastomeric sealing- surface facepiece respirator outfitted with organic vapor cartridges and paint spray (dust/mist) prefilters. Determine the proper level of protection by conducting appropriate air monitoring. Consult 29CFR1910.134 For selection of respirators (Canadian z94.4).

Ventilation : Provide dilution ventilation or local exhaust to prevent build-up of vapors.

Personal protective equipment : Eye wash, safety shower, safety glasses or goggles. Impervious gloves, impervious clothing.

STABILITY AND REACTIVITY

(ANSI Section 10)

Under normal conditions : Stable see section 5 fire fighting measures

Materials to avoid : Oxidizers, acids, bases, Styrene monomer.

Conditions to avoid : Elevated temperatures, contact with oxidizing agent, freezing, sparks, open flame.

Hazardous polymerization : Will not occur

TOXICOLOGICAL INFORMATION

(ANSI Section 11)

Supplemental health information : No additional effects are anticipated

Carcinogenicity : In a lifetime inhalation study, exposure to 250 mg/m³ titanium dioxide resulted in the development of lung tumors in rats. These tumors occurred only at dust levels that overwhelmed the animals' lung clearance mechanisms and were different from common human lung tumors in both type and location. The relevance of these findings to humans is unknown but questionable. The international agency for research on cancer (IARC) has classified titanium dioxide as possibly carcinogenic to humans (group 2b) based on inadequate evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.

Reproductive effects : No reproductive effects are anticipated

Mutagenicity : No mutagenic effects are anticipated

Teratogenicity : No teratogenic effects are anticipated

ECOLOGICAL INFORMATION

(ANSI Section 12)

No ecological testing has been done by akzo nobel paints llc on this product as a whole.

DISPOSAL CONSIDERATIONS

(ANSI Section 13)

Waste disposal : Dispose in accordance with all applicable regulations. Avoid discharge to natural waters.

REGULATORY INFORMATION

(ANSI Section 15)

As of the date of this MSDS, all of the components in this product are listed (or are otherwise exempt from listing) on the TSCA inventory. This product has been classified in accordance with the hazard criteria of the CPR (controlled products regulations) and the MSDS contains all the information required by the CPR.

The information contained herein is based on data available at the time of preparation of this data sheet which Akzo Nobel Paints believes to be reliable. However, no warranty is expressed or implied regarding the accuracy of this data. Akzo Nobel Paints shall not be responsible for the use of this information, or of any product, method or apparatus mentioned and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and the health and safety of your employees and the users of this material. Complies with OSHA hazard communication standard 29CFR1910.1200.

Physical Data

(ANSI Sections 1, 9, and 14)

| Product Code | Description | Wt. / Gal. | VOC gr. / ltr. | % Volatile by Volume | Flash Point | Boiling Range | HMS | DOT, proper shipping name |
|--------------|--|------------|----------------|----------------------|-------------|---------------|-----|-----------------------------------|
| 1412-0100V | glidden ultra-hide interior latex eggshell wall & trim enamel, white | 10.35 | 48.04 | 68.36 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-0110V | glidden ultra-hide interior latex eggshell wall & trim enamel - white tint base | 10.38 | 47.97 | 68.30 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-0300V | glidden ultra-hide interior latex eggshell wall & trim enamel - intermediate tint base | 10.03 | 48.66 | 67.86 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-0400V | glidden ultra-hide interior latex eggshell wall & trim enamel - deep tint base | 9.61 | 49.54 | 69.35 | none | 212-212 | 310 | paint ** protect from freezing ** |
| 1412-1010V | glidden ultra-hide latex eggshell interior wall & trim enamel, swiss coffee | 10.34 | 47.80 | 68.27 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-1020V | glidden ultra-hide latex eggshell interior wall & trim enamel, antique white | 10.35 | 47.71 | 68.22 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-1270N | glidden ultra-hide latex eggshell interior wall & trim enamel, navajo white | 10.35 | 43.78 | 68.29 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-1380V | glidden ultra-hide interior latex eggshell wall & trim enamel - dove white | 10.35 | 47.64 | 68.26 | none | 212-501 | 310 | paint ** protect from freezing ** |

Ingredients

Product Codes with % by Weight (ANSI Section 2)

| Chemical Name | Common Name | CAS. No. | 1412-0100V | 1412-0110V | 1412-0300V | 1412-0400V | 1412-1010V | 1412-1020V | 1412-1270N | 1412-1380V |
|---|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| kaolin | clay | 1332-58-7 | 5-10 | 5-10 | 1-5 | 5-10 | 5-10 | 5-10 | 5-10 | 5-10 |
| silicic acid, aluminum sodium salt | sodium aluminosilicate | 1344-00-9 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 |
| titanium oxide | titanium dioxide | 13463-67-7 | 10-20 | 10-20 | 10-20 | 1-5 | 10-20 | 10-20 | 10-20 | 10-20 |
| 2-propanoic acid, butyl ester, polymer with ethenyl acetate | vinyl acrylic latex | 25067-01-0 | 10-20 | 10-20 | 10-20 | 10-20 | 10-20 | 10-20 | 10-20 | 10-20 |
| propanoic acid, 2-methyl-, monoester with 2,2,4-trimethyl-1,3-pentanediol | texanol | 25265-77-4 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 | 1-5 |
| nepheline syenite | feldspar-type minerals | 37244-96-5 | | | | 10-20 | | | | |
| ceramic materials and wares, chemicals | calcined kaolin clay | 66402-68-4 | | | 1-5 | | | | | |
| water | water | 7732-18-5 | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 |
| acrylic resin | acrylic resin | Sup. Conf. | | | 1-5 | 1-5 | | | | |

Chemical Hazard Data

(ANSI Sections 2, 8, 11, and 15)

| Common Name | CAS. No. | ACGIH-TLV | | | | OSHA-PEL | | | | S.R. Std. | S2 | S3 | CC | H | M | N | I | O |
|------------------------|------------|------------|----------|----------|----------|------------|----------|----------|----------|-----------|----|----|----|---|---|---|---|---|
| | | 8-Hour TWA | STEL | C | S | 8-Hour TWA | STEL | C | S | | | | | | | | | |
| clay | 1332-58-7 | 2 mg/m3 | not est. | not est. | not est. | 5 mg/m3 | not est. | not est. | not est. | not est. | n | n | n | n | n | n | n | n |
| sodium aluminosilicate | 1344-00-9 | 10 mg/m3 | not est. | not est. | not est. | 5 mg/m3 | not est. | not est. | not est. | not est. | n | n | n | n | n | n | n | n |
| titanium dioxide | 13463-67-7 | 10 mg/m3 | not est. | not est. | not est. | 10 mg/m3 | not est. | not est. | not est. | not est. | n | n | n | n | n | n | y | y |
| vinyl acrylic latex | 25067-01-0 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n | n | n |
| texanol | 25265-77-4 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n | n | n |
| feldspar-type minerals | 37244-96-5 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n | n | n |
| calcined kaolin clay | 66402-68-4 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n | n | n |

Footnotes:

C=Ceiling - Concentration that should not be exceeded, even instantaneously.
S=Skin - Additional exposure, over and above airborne exposure, may result from skin absorption.

n/a=not applicable
not est.=not established
CC=CERCLA Chemical
Sup Conf.=Supplier Confidential

ppm=parts per million
mg/m3=milligrams per cubic meter
S.R. Std.=Supplier Recommended Standard

S2=Sara Section 302 EHS
S3=Sara Section 313 Chemical
S.R. Std.=Supplier Recommended Standard

H=Hazardous Air Pollutant, M=Marine Pollutant
P=Pollutant, S=Severe Pollutant
Carcinogenicity Listed By:
N=NTP, I=IARC, O=OSHA, y=yes, n=no

GLIDDEN ULTRA-HIDE 150 INTERIOR EGGSHELL PAINT

[RELATED SECTION 09 91 23]

Model Number: 1412-0110V

Location: Flex Space Walls and Ceiling

Finish: eggshell

Color: white tint base

Solids:

Volume: 32%

Weight: 45%

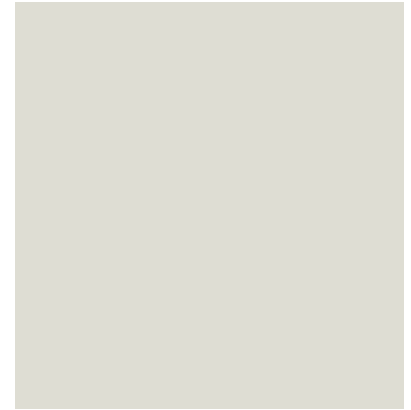
Features:

Dry time: 30-60 min.

Flame spreading rating: class A

Shelf life: 1 year unopened

Availability: Boone Paint & Interiors





ULTRA-HIDE® 150 Interior Eggshell Paint 1412-XXXXV

Previously GLIDDEN™ ULTRA-HIDE®
Interior Eggshell Wall & Trim Enamel

DESCRIPTION

GLIDDEN PROFESSIONAL™ ULTRA-HIDE® 150 paint is a high-hiding, easy-to-apply interior wall and trim paint that delivers excellent burnish resistance and durability. Recommended for all commercial and property maintenance applications where a uniform, durable interior finish is required.

CERTIFICATIONS

| AS OF 7/1/2009, COMPLIES WITH | |
|-------------------------------|-----|
| MPI# | 44 |
| LEED | Yes |
| CHPS | Yes |
| GREENGUARD | No |
| AIM | Yes |
| OTC/LADCO | Yes |
| CARB | Yes |
| SCAQMD | Yes |

PERFORMANCE DATA

| CHARACTERISTIC: | RESULTS: |
|---|-------------------------------|
| Airless Spray Touch-Up* | ★★★★★★☆☆ |
| Dry Hide* | ★★★★★★☆☆ |
| Burnish Resistance* | ★★★★★★☆☆ |
| Shim Scrub Resistance* | ★★★★★★☆☆ |
| Washability* | ★★★★★★☆☆ |
| Sag Resistance | 14-18 mils wet |
| Air and Substrate Application Temperature | 50° F (10° C) - 90° F (32° C) |
| Service Temperature Limits | 200° F (93° C) |
| Storage Temperature | 40° (4° C) F - 95° F (35° C) |

*Performance ratings are based on product comparisons to other products in that sheen range, performed at 77° F (25° C) 50% RH. Rating scale is from 1-10, 10 being the highest rating.

COMPOSITION

- Vinyl-Acrylic Resin
- Titanium Dioxide and Extender Pigments
- Not manufactured with lead or mercury containing materials.

SPECIFICATION

Color:

White, ready mix & custom colors

Clean-up Solvent:

Soap and water

Finish: Eggshell

Sheen: 10 - 35 units @ 85°

Gloss: 5 - 12 units @ 60°

Density:

10.38 lbs/gal (1.25 kg/L)

Solids:

Volume - 32% +/- 1%

Weight - 45% +/- 1%

VOC:

50 g/L (0.42 lbs/gal) maximum

Refer to MSDS for regulatory VOC content of complete product line

Theoretical Coverage @ 1 mil dry:

508 sq ft/gal (12 m²/L)

Practical Coverage:

Apply at 350-400 sq ft/gal (9-10 m²/L).

Actual coverage may vary depending on substrate and application method.

Recommended Film Thickness:

4.0 - 4.6 mils wet

1.3 - 1.5 mils dry

Airless Spray Application:

Pressure - 2000 psi

Tip - .015" - .019"

Dry Time 77°F (25°C) & 50% RH:

To touch - 30-60 minutes

To recoat - 2-4 hours

Flame Spread Rating:

Class A (0-25) on non-combustible surfaces

Flash Point:

None

Shelf Life:

1 year minimum - unopened



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9 FINISHES
PAINTING (09900)

HAZARDS IDENTIFICATION (ANSI Section 3)

Primary route(s) of exposure : Inhalation, skin contact, eye contact, ingestion.

Effects of overexposure :

Inhalation : Irritation of respiratory tract. Prolonged inhalation may lead to mucous membrane irritation, headache, nausea, chest pain, coughing, difficulty of breathing, severe lung irritation or damage, pneumoconiosis.

Skin contact : Irritation of skin.

Eye contact : Irritation of eyes.

Ingestion : Ingestion may cause mouth and throat irritation, gastro-intestinal disturbances.

Medical conditions aggravated by exposure : Eye, skin, respiratory disorders, lung disorders, asthma-like conditions.

FIRST-AID MEASURES

(ANSI Section 4)

Inhalation : Remove to fresh air. Restore and support continued breathing. Get emergency medical attention. Have trained person give oxygen if necessary. Get medical help for any breathing difficulty. Remove to fresh air if inhalation causes eye watering, headaches, dizziness, or other discomfort.

Skin contact : Wash thoroughly with soap and water. If any product remains, gently rub petroleum jelly, vegetable or mineral/baby oil onto skin. Repeated applications may be needed. Remove contaminated clothing. Wash contaminated clothing before re-use.

Eye contact : Flush immediately with large amounts of water, especially under lids for at least 15 minutes. If irritation or other effects persist, obtain medical treatment.

Ingestion : If swallowed, obtain medical treatment immediately.

FIRE-FIGHTING MEASURES

(ANSI Section 5)

Fire extinguishing media : Dry chemical or foam water fog. Carbon dioxide. Closed containers may burst if exposed to extreme heat or fire. In closed tanks, water or foam may cause frothing or eruption.

Fire fighting procedures : Water may be used to cool and protect exposed containers. Firefighters should use full protective clothing, eye protection, and self-contained breathing apparatus.

Hazardous decomposition or combustion products : Carbon monoxide, carbon dioxide, acrylic monomers, Sodium oxide.

ACCIDENTAL RELEASE MEASURES

(ANSI Section 6)

Steps to be taken in case material is released or spilled : Comply with all applicable health and environmental regulations. Eliminate all sources of ignition. Ventilate area. Spills may be collected with absorbent materials. Evacuate all unnecessary personnel. Place collected material in proper container. Spilled material is extremely slippery. Small spills - use absorbent to pick up residue and dispose of properly.

HANDLING AND STORAGE

(ANSI Section 7)

Handling and storage : Store below 100F (38C). Keep from freezing.

Other precautions : Use only with adequate ventilation. Do not take internally. Keep out of reach of children. Avoid contact with skin and eyes, and breathing of vapors. Wash hands thoroughly after handling, especially before eating or smoking. Keep containers tightly closed and upright when not in use. Avoid conditions which result in formation of inhalable particles such as spraying or abrading (sanding) painted surfaces. If such conditions cannot be avoided, use appropriate respiratory protection as directed under exposure controls/personal protection.

EXPOSURE CONTROLS/PERSONAL PROTECTION (ANSI Section 8)

Respiratory protection : Control environmental concentrations below applicable exposure standards when using this material. When respiratory protection is determined to be necessary, use a NIOSH/MSHA (Canadian z94.4) Approved elastomeric sealing- surface facepiece respirator outfitted with organic vapor cartridges and paint spray (dust/mist) prefilters. Determine the proper level of protection by conducting appropriate air monitoring. Consult 29CFR1910.134 For selection of respirators (Canadian z94.4).

Ventilation : Provide dilution ventilation or local exhaust to prevent build-up of vapors.

Personal protective equipment : Eye wash, safety shower, safety glasses or goggles. Impervious gloves, impervious clothing.

STABILITY AND REACTIVITY

(ANSI Section 10)

Under normal conditions : Stable see section 5 fire fighting measures

Materials to avoid : Oxidizers, acids, bases, Styrene monomer.

Conditions to avoid : Elevated temperatures, contact with oxidizing agent, freezing, sparks, open flame.

Hazardous polymerization : Will not occur

TOXICOLOGICAL INFORMATION

(ANSI Section 11)

Supplemental health information : No additional effects are anticipated

Carcinogenicity : In a lifetime inhalation study, exposure to 250 mg/m³ titanium dioxide resulted in the development of lung tumors in rats. These tumors occurred only at dust levels that overwhelmed the animals' lung clearance mechanisms and were different from common human lung tumors in both type and location. The relevance of these findings to humans is unknown but questionable. The international agency for research on cancer (IARC) has classified titanium dioxide as possibly carcinogenic to humans (group 2b) based on inadequate evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.

Reproductive effects : No reproductive effects are anticipated

Mutagenicity : No mutagenic effects are anticipated

Teratogenicity : No teratogenic effects are anticipated

ECOLOGICAL INFORMATION

(ANSI Section 12)

No ecological testing has been done by akzo nobel paints llc on this product as a whole.

DISPOSAL CONSIDERATIONS

(ANSI Section 13)

Waste disposal : Dispose in accordance with all applicable regulations. Avoid discharge to natural waters.

REGULATORY INFORMATION

(ANSI Section 15)

As of the date of this MSDS, all of the components in this product are listed (or are otherwise exempt from listing) on the TSCA inventory. This product has been classified in accordance with the hazard criteria of the CPR (controlled products regulations) and the MSDS contains all the information required by the CPR.

Physical Data

(ANSI Sections 1, 9, and 14)

| Product Code | Description | Wt. / Gal. | VOC gr. / ltr. | % Volatile by Volume | Flash Point | Boiling Range | HMS | DOT, proper shipping name |
|--------------|--|------------|----------------|----------------------|-------------|---------------|-----|-----------------------------------|
| 1412-0100V | glidden ultra-hide interior latex eggshell wall & trim enamel, white | 10.35 | 48.04 | 68.36 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-0110V | glidden ultra-hide interior latex eggshell wall & trim enamel - white tint base | 10.38 | 47.97 | 68.30 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-0300V | glidden ultra-hide interior latex eggshell wall & trim enamel - intermediate tint base | 10.03 | 48.66 | 67.86 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-0400V | glidden ultra-hide interior latex eggshell wall & trim enamel - deep tint base | 9.61 | 49.54 | 69.35 | none | 212-212 | 310 | paint ** protect from freezing ** |
| 1412-1010V | glidden ultra-hide latex eggshell interior wall & trim enamel, swiss coffee | 10.34 | 47.80 | 68.27 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-1020V | glidden ultra-hide latex eggshell interior wall & trim enamel, antique white | 10.35 | 47.71 | 68.22 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-1270N | glidden ultra-hide latex eggshell interior wall & trim enamel, navajo white | 10.35 | 43.78 | 68.29 | none | 212-501 | 310 | paint ** protect from freezing ** |
| 1412-1380V | glidden ultra-hide interior latex eggshell wall & trim enamel - dove white | 10.35 | 47.64 | 68.26 | none | 212-501 | 310 | paint ** protect from freezing ** |

Ingredients

Product Codes with % by Weight (ANSI Section 2)

| Chemical Name | Common Name | CAS. No. | 1412-0100V | 1412-0110V | 1412-0300V | 1412-0400V | 1412-1010V | 1412-1020V | 1412-1270N | 1412-1380V |
|---|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| kaolin | clay | 1332-58-7 | 5-10 | 5-10 | 1-5 | | 5-10 | 5-10 | 5-10 | 5-10 |
| silicic acid, aluminum sodium salt | sodium aluminosilicate | 1344-00-9 | 1-5 | 1-5 | 1-5 | | 1-5 | 1-5 | 1-5 | 1-5 |
| titanium oxide | titanium dioxide | 13463-67-7 | 10-20 | 10-20 | 10-20 | | 10-20 | 10-20 | 10-20 | 10-20 |
| 2-propanoic acid, butyl ester, polymer with ethenyl acetate | vinyl acrylic latex | 25067-01-0 | 10-20 | 10-20 | 10-20 | | 10-20 | 10-20 | 10-20 | 10-20 |
| propanoic acid, 2-methyl-, monoester with 2,2,4-trimethyl-1,3-pentanediol | texanol | 25265-77-4 | 1-5 | 1-5 | 1-5 | | 1-5 | 1-5 | 1-5 | 1-5 |
| nepheline syenite | feldspar-type minerals | 37244-96-5 | | | | | | | | |
| ceramic materials and wares, chemicals | calcined kaolin clay | 66402-68-4 | | | 1-5 | | | | | |
| water | water | 7732-18-5 | 50-60 | 50-60 | 50-60 | | 50-60 | 50-60 | 50-60 | 50-60 |
| acrylic resin | acrylic resin | Sup. Conf. | | | 1-5 | | 1-5 | | | |

Chemical Hazard Data

(ANSI Sections 2, 8, 11, and 15)

| Common Name | CAS. No. | ACGIH-TLV | | | | | | OSHA-PEL | | | | | | S.R. | | | | | |
|------------------------|------------|------------|----------|----------|----------|------------|----------|----------|----------|----------|----------|----------|----------|------|---|---|---|---|---|
| | | 8-Hour TWA | STEL | C | S | 8-Hour TWA | STEL | C | S | S2 | S3 | CC | Std. | H | M | N | I | O | |
| clay | 1332-58-7 | 2 mg/m3 | not est. | not est. | not est. | 5 mg/m3 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| sodium aluminosilicate | 1344-00-9 | 10 mg/m3 | not est. | not est. | not est. | 5 mg/m3 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| titanium dioxide | 13463-67-7 | 10 mg/m3 | not est. | not est. | not est. | 10 mg/m3 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | y | y |
| vinyl acrylic latex | 25067-01-0 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| texanol | 25265-77-4 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| feldspar-type minerals | 37244-96-5 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |
| calcined kaolin clay | 66402-68-4 | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | not est. | n | n | n | n | n | n |

Footnotes:

C=Ceiling - Concentration that should not be exceeded, even instantaneously.

S=Skin - Additional exposure, over and above airborne exposure, may result from skin absorption.

n/a=not applicable
mg/m3-milligrams per cubic meter
Sup Conf=Supplier Confidential

S2=Sara Section 302 EHS
S3=Sara Section 313 Chemical
S.R. Std.=Supplier Recommended Standard

H=Hazardous Air Pollutant, M=Marine Pollutant
P=Pollutant, S=Severe Pollutant
Carcinogenicity Listed By:
N=NTP, I=IARC, O=OSHA, y=yes, n=no

ZAR EXTERIOR STAIN

[RELATED SECTION 09 93 13.13]

Model Number: 812

Location: Main House exterior siding

Finish: dark tint base

Color: matched to mark twain gray brick

Solids:

Volume: 22% to 24 %

Weight: 24% to 29%

Features:

Dry time: 1 to 2 hrs.

Coverage: 300 to 400 ft. per gal.

pH: 8.0 to 9.0

Availability: Lowes





PRODUCT DATA SHEET

ZAR® DECK & SIDING SEMI-TRANSPARENT EXTERIOR STAIN

DESCRIPTION

ZAR Deck & Siding Semi-Transparent Exterior Stain is specially formulated to accent the natural grain, texture and beauty of wood. Protects and shields against the damaging effects of rain, salt air and ultraviolet rays.

Recommended for use on new or previously stained (same approximate color semi-transparent deck or siding stain) decks, railings, posts, sheds and siding. ZAR Semi-Transparent Deck & Siding Exterior Stain is a waterborne oil-base formula that offers the richness and color of an oil-base stain with ease of application and clean-up of a water-based product. ZAR's deep penetration provides maximum protection and durability.

SURFACE PREP

Decks:

Surface must be clean, dry and in good condition. Remove all mildew, dirt, dust, loose wood fibers, paint flakes, oil and grease. Repair or replace any loose, cracked or warped boards.

All mildew (dark, fuzzy or powdery deposits) must be removed with the following solution: 1/3 cup heavy-duty laundry detergent to 1 quart household bleach to 3 quarts of warm water. Or use ZAR Deck & Siding Cleaner. Apply with a scrubbing brush. Rinse thoroughly and allow to dry before staining. Wear protective eye goggles and waterproof gloves when handling cleaning solution.

For Old Grayed Wood Exposed to UV (Sunlight) for more than 3 months:
Lightly sand or power wash the

surface to remove the thin layer of degraded wood before applying Deck & Siding Stain. Clean surface as above. Always allow the wood to dry thoroughly after power washing and prior to application of the stain.

NOTE: Do not apply over clear finishes. Do not pre-treat or use a water repellent preservative. Test the wood for factory treatment by sprinkling a few drops of water on the surface. If water is readily absorbed into the wood, proceed. If not, do not apply stain. Wait 2-3 months and then retest.

Siding:

Surface must be clean, dry and in good condition. Remove all mildew, dirt, dust, loose wood fibers, oil and grease. Repair or replace any loose, cracked or warped boards. In warm weather, wet the surface with water and apply stain while surface is still damp to ensure color uniformity and to minimize lap marks.

Previously Stained Wood: Clean thoroughly and remove all loose or flaking stain by scrapping.

APPLICATION

Apply only when air and surface temperatures are above 50°F. DO NOT THIN. Stir thoroughly before and during application. Do not apply if rain is expected within 24 hours. When using two or more containers of the same color, mix together to ensure color uniformity. Avoid applying in direct sunlight. Test ZAR Deck & Siding on a sample piece of wood or in an inconspicuous area to determine final color. May be sprayed, but application with a synthetic brush is recommended. If sprayed, coating should be dry

brushed or back rolled for color uniformity.

Apply one coat. One coat will protect and beautify the wood while allowing the natural grain to show through. An additional coat may be needed on surfaces that are aged or extremely porous. On vertical siding, start at top on several boards and apply continuously across to a break at a door, window or corner. Be sure to maintain a wet edge.

WARNING

WARNING! If you scrape, sand, or remove old paint, you may release lead dust. LEAD IS TOXIC. EXPOSURE TO LEAD CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a NIOSH approved respirator to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead.

MAINTENANCE

Areas with harsh exposure to sun, wether or foot traffic will show wear more quickly than other surfaces. If this occurs, clean affected areas and recoat as necessary.

CAUTION

Keep out of reach of children. Keep from freezing. Do not take internally. Please read Material safety Data Sheet for additional information.

ZAR® DECK AND SIDING SEMI-TRANSPARENT EXTERIOR STAIN

TECHNICAL DATA

| | |
|-------------------------------------|---|
| Viscosity | 16 to 20 seconds #4 Ford Cup |
| pH | 8.0 to 9.0 |
| % Solids by Weight | 24 to 29 |
| % Solids by Volume | 22 to 24 |
| Coverage | 300 TO 400 ft per gal. For uneven or highly porous surfaces 10 to 200 ft per gal. |
| Recommended film thickness per coat | 4 to 5 wet mils |
| Dry Time (to touch)* | 1 to 2 hours |
| Dry Time (to recoat)* | 4 hours |
| Dry Time (for decks)* | 24 to 28 hours |
| VOC Content | .250 g/L |

*Dry time is dependent upon temperature and humidity. Apply when temperature is between 50° and 80°F and relative humidity is below 60%.

AVAILABILITY

ZAR Deck & Siding Semi-Transparent Exterior Stain comes in seven ready mixed colors and light and dark bases for custom color tinting. Available at your favorite paint store, home center, hardware store and lumberyard in one gallon containers.



MATERIAL SAFETY DATA SHEET

PRODUCT NAME: ZAR DECK & SIDING STAIN - SEMI-TRANSPARENT - ALL COLORS
PRODUCT CODE: 0901, 0902, 0903, 0904, 0907, 0908, 0952, 0953, 0954

HMS CODES: H F R P
1 0 0

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURE'S NAME: UNITED GILSONITE LABORATORIES
ADDRESS: 1396 JEFFERSON AVENUE
SCRANTON, PA 18509

EMERGENCY PHONE: (800) 424-9300
INFORMATION PHONE: (570) 344-1202
NAME OF PREPARER: R. BARAKO

DATE ISSUED: JUNE 2006
SUPERSEDES: JANUARY 2006

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

| HAZARDOUS COMPONENTS | CAS NUMBER | OCCUPATIONAL EXPOSURE LIMITS | | | VAPOR PRESSURE mmHg@TEMP | WEIGHT PERCENT |
|--|-------------|------------------------------|----------------------|---------------|-----------------------------|-------------------|
| | | OSHA PEL | ACGIH TLV | OTHER | | |
| WATER | 7732-18-5 | NOT ESTAB | NOT ESTAB | NOT ESTAB | 1.0 (68F) | 60 |
| *ETHYLENE GLYCOL MONO - BUTYL ETHER | 111-76-2 | 25 PPM (SKIN) | 25 PPM (SKIN) | 5 PPM (NIOSH) | 0.9 (77F) | 6 |
| MODIFIED OIL POLYMER | PROPRIETARY | NOT ESTAB | NOT ESTAB | NOT ESTAB | N/A | 20 |
| CALCINED DIATOMACEOUS - EARTH | 6855-54-9 | 5 MG/M ³ | 10 MG/M ³ | NOT ESTAB | N/A | <5 |
| WAX EMULSION | NOT ESTAB | NOT ESTAB | NOT ESTAB | NOT ESTAB | N/A | <5 |

* Indicates toxic chemical (s) subject to the reporting requirements of Section 313 of Title III and of CFR 372
SEE SECTION IX FOR LIST OF ADDITIONAL INGREDIENTS

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 212 F
VAPOR DENSITY: HEAVIER THAN AIR
COATING V.O.C.: DOES NOT EXCEED MAXIMUM VOC 250 G/L (VOS 2.08 LB/GAL)
SOLUBILITY IN WATER: SOLUBLE
APPEARANCE AND ODOR: WHITE OR COLORS, PRODUCT SPECIFIC. TYPICAL AMINE ODOR

SPECIFIC GRAVITY (H₂O = 1): 1.0
EVAPORATION RATE: SLOWER THAN ETHER

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A
FLAMMABLE LIMITS IN AIR BY VOLUME:
EXTINGUISHING MEDIA: NONE KNOWN
SPECIAL FIRE FIGHTING PROCEDURES: CONTAINERS MAY SWELL AND BURST DURING A FIRE DUE TO INTERNAL PRESSURE CAUSED BY HEAT. THIS MAY CAUSE A SLIPPERY CONDITION ON FLOORS

UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A

METHOD USED: N/A
LOWER: 1.1% UPPER: 10.6%

SECTION V - REACTIVITY DATA

STABILITY: PRODUCT IS STABLE

CONDITIONS TO AVOID: TEMPERATURES BELOW 32 (F) FOR STORAGE. TEMPERATURES BELOW 50 (F) FOR APPLICATION

INCOMPATIBILITY (MATERIALS TO AVOID): N/A

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: N/A

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI – HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: IN IT'S WET STATE, THIS PRODUCT SHOULD NOT POSE ANY THREAT TO HEALTH DUE TO OVEREXPOSURE

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: DIRECT CONTACT MAY CAUSE BURNING, TEARING, REDNESS AND SWELLING

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: CAN CAUSE SLIGHT IRRITATION

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: MAY PRODUCE SIGNS OF INTOXICATION CHARACTERIZED BY INCOORDINATION, DIZZINESS, HEADACHE, NAUSEA, MENTAL CONFUSION, SLURRED SPEECH DEPENDING ON THE QUANTITY OF MATERIAL INGESTED

HEALTH HAZARDS (ACUTE AND CHRONIC) NONE KNOWN

CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? YES OSHA REGULATED? NO
TITANIUM DIOXIDE HAS BEEN CHARACTERIZED BY IARC AS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B) THROUGH INHALATION (NOT INGESTION). THIS CLASSIFICATION IS BASED UPON ANIMAL INHALATION STUDIES. EPIDEMIOLOGY STUDIES DO NOT SUGGEST AN INCREASED RISK OF CANCER IN HUMANS FROM OCCUPATIONAL EXPOSURE TO TITANIUM DIOXIDE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: INHALATION OF THE SPRAYED MATERIAL OR THE DUST FROM SANDING THE DRY FILM CAN AGGRAVATE RESPIRATORY CONDITIONS

EMERGENCY AND FIRST AID PROCEDURES:

EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. CONSULT A PHYSICIAN IF IRRITATION PERSISTS.

SKIN: WASH AFFECTED AREA WITH SOAP AND WATER. CONSULT A PHYSICIAN IF IRRITATION PERSISTS

INGESTION: GIVE ONE OR TWO GLASSES OF WATER. IF INDIVIDUAL IS DROWSY OR UNCONSCIOUS DO NOT GIVE ANYTHING BY MOUTH. CONSULT A PHYSICIAN, MEDICAL FACILITY OR POISON CONTROL CENTER FOR ADVICE ABOUT WHETHER TO INDUCE VOMITING

INHALATION: REMOVE VICTIM TO FRESH AIR

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: DIKE AREA AROUND SPILL. APPLY ABSORBENT MATERIAL, THEN SWEEP UP AND PLACE IN PROPER CONTAINERS

WASTE DISPOSAL METHOD: DISPOSE OF IN APPROVED SITES ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: AVOID BRATHING DUST. KEEP FROM FREEZING. STORE MATERIAL IN AREAS WHERE TEMPERATURES RANGE FROM 50 (F) TO 90 (F)

OTHER PRECAUTIONS: N/A

SECTIONS VIII – CONTROL MEASURES

RESPIRATORY PROTECTION: WHEN SPRAYING OR SANDING DRY FILM, USE NIOSH APPROVED RESPIRATORS WITH SOLID PARTICULATE CARTRIDGES

VENTILATION: USE ADEQUATE VENTILATION IN VOLUME AND PATTERN TO MAINTAIN EXPOSURE LEVELS BELOW THAT LISTED IN SECTIONS II & IX

PROTECTIVE GLOVES: USE NEOPRENE RUBBER GLOVES TO PREVENT SKIN CONTACT

EYE PROTECTION: USE CHEMICAL SPLASH GOGGLES WITH SIDE SHIELDS

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE

WORK / HYGIENIC PRACTICES: WASH HANDS BEFORE EATING, SMOKING OR USING WASH ROOM. WASH COMTAMINATED CLOTHING BEFORE REUSE.

SECTION IX – ADDITIONAL INGREDIENTS

| PRODUCT | INGREDIENT | CAS. NO. | PERCENT (WT) | OCCUPATIONAL EXPOSURE LIMITS | |
|---------------------------------------|--|---------------------------------------|-----------------|---|--|
| | | | | TLV | PEL |
| (0901) DESERT SAND | TITANIUM DIOXIDE DISPERSED COLORANT | 13463-67-7 NOT ESTAB | <5 <5 | 10 MG/M ³ NOT ESTAB | 15 MG/M ³ NOT ESTAB |
| (0902) CAPE COD GRAY | TITANIUM DIOXIDE | 13463-67-7 | < 5 | 10 MG/M ³ | 15 MG/M ³ |
| (0903) CEDARWOOD | TITANIUM DIOXIDE DISPERSED COLORANT | 13463-67-7 NOT ESTAB | <5 <5 | 10 MG/M ³ NOT ESTAB | 15 MG/M ³ NOT ESTAB |
| (0904) RUSTIC BROWN | DISPERSED COLORANT | NOT ESTAB | 5 | NOT ESTAB | NOT ESTAB |
| (0907) NATURAL HONEY GOLD TONER | DISPERSED COLORANT | NOT ESTAB | <5 | NOT ESTAB | NOT ESTAB |
| (0908) NATURAL REDWOOD TONER | DISPERSED COLORANT | NOT ESTAB | <5 | NOT ESTAB | NOT ESTAB |
| (0952) REDWOOD | RED IRON OXIDE YELLOW IRON OXIDE BURNT UMBER | 1332-37-2 51274-00-1 12713-03-0 | <5 <5 <5 | 5 MG/M ³ (1) 5 MG/M ³ (1) 5 MG/M ³ | 10 MG/M ³ (1) 10 MG/M ³ (1) 10 PPM |
| (0953) LIGHT TINT BASE | TITANIUM DIOXIDE | 13463-67-7 | <5 | 10 MG/M ³ | 15MG/M ³ |
| (0954) DARK TINT BASE | | SEE SECTION II | | | |

(1) = TIME WEIGHTED AVERAGE

SECTION X – DISCLAIMER

This information is furnished without warranty, representation, inducement or license of any kind, except that it is accurate to the best of UGL's knowledge, or obtained from sources believed by UGL to be accurate, and UGL does not assume any legal responsibility for use or reliance upon same. Before using any product, read the label.

SUPERDECK PRESSURE TREATED WOOD STAIN

[RELATED SECTION 09 93 13.13]

Model Number: DB 2001

Location: Great Porch and Deck Deck Boards

Finish: cedar

Features:

Density: 7.14 lbs./gal

Availability: Boone Paint & Interiors



Product Data Guide: Pressure Treated Wood Stain 2000 Series - 250 VOC

SUPERDECK® Pressure Treated Wood Stain has been uniquely formulated to transform pressure treated wood from its original color to natural wood tones while accentuating its distinctive grain pattern. Transparent iron oxide pigments provide a rich, warm appearance and protects against harmful UV rays, while the three oil system and highly effective mildewcides protect against water damage and mildew stains. Product is resistant to foot traffic patterning and will not track.

USES: All exterior pressure treated and non-treated wood.

COLORS:

DB 2001-CEDAR

DB 2005-HEART REDWOOD

DB 2007-CANYON BROWN

DB 2010-NATURAL

DB 2014-VALLEY

DB 2016-GOLDEN OAK

VOC: 250

PRODUCT HIGHLIGHTS:

- One Coat Coverage
- Penetrating 3-Oil System
- Maximum Grain Clarity
- Use on All Exterior Wood

SURFACE PREPARATION: DO NOT APPLY OVER SEALED SURFACES. Remove previous oxidized stains with Superdeck® Wood Cleaner. **NEW WOOD** that has not been kiln dried must be allowed to season 2 to 4 weeks before applying product. Dry time will vary depending on weather and moisture content of wood. Wood may be clean enough to directly apply stain. If not, or if wood has mill glaze, clean redwood and cedar surfaces with Superdeck® Wood Brightener; clean pressure treated wood surfaces with Wood Cleaner. **WEATHERED WOOD** should be free from dirt and other foreign materials. Thoroughly clean all wood surface types with Wood Cleaner and rinse. For redwood and cedar, follow with Wood Brightener to remove tannin stains and brighten wood to its original color.

NOTE: This product is lead free. **WARNING!** If you scrape, sand or remove old paint, you may release lead dust. **LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE.** Wear a NIOSH-approved respirator to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800- 424-LEAD or log on to www.epa.gov/lead.

PRODUCT PREPARATION: Product should be shaken or stirred before and during application.

THINNING: None required.



APPLICATION METHODS: Product may be brushed, rolled or sprayed. If sprayed, use the lowest possible pressure needed for a reasonable spray pattern. Back rolling is suggested when spraying, working the product smoothly and evenly into the wood. This will decrease the possibility of pools or puddles on the surface and ensure a properly penetrated finish.

APPLICATION: Proper application is essential in order to accomplish the full benefits of product appearance and performance. Different wood species, textures and natural color will affect finished shade. Always test a small area first for color satisfaction before coating entire project. Pressure Treated Wood Stain is a penetrating stain that must be applied only at a rate the wood will absorb. Do not pool or puddle product on surface. Excess product allowed to sit on surface will result in a tacky finish and extended dry time. Remove tacky finish with mineral spirits within 24 hours of application or with a mild solution of Wood Cleaner after 24 hours. When properly applied, the wood surface will have a positive dry and the wood fibers beneath the surface will maintain excellent lubrication. Thoroughly coat the porous ends of all boards with product.

NUMBER OF COATS: One coat depending on wood porosity and wood moisture content.

APPLICATION TEMPERATURE: 40° F.–95° F. Do not apply if wood surface is hot to touch or if rain is likely to occur.

DRY TIME @ 77° F: 8 hours to touch, 24 hours for traffic; depending on weather conditions.

SPREAD RATE: Approximate spread rate: Smooth Surfaces: 250–350 sq. ft./gal.; Rough Sawn: 150–250 sq. ft./gal.

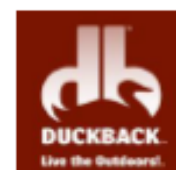
STORAGE: Pour remaining product into smaller container to reduce skin forming on product. If skin does form, remove it and strain product before re-use.

CLEAN UP/DISPOSAL: Clean brushes and equipment with mineral spirits. Dispose of empty container or unused portion in accordance with local, state, and federal regulations. Soak oily rags, steel wool, roller covers, and other stain soaked materials in water after use to avoid spontaneous combustion.

DANGER! AVOID SPONTANEOUS COMBUSTION: Product contains drying oils (linseed oil & tung oil). Rags, steel wool, roller covers, or any other waste soaked with product may spontaneously catch fire if improperly discarded. Immediately after each use, place rags, steel wool, roller covers, or any other waste in a sealed water-filled metal container.

CONTAINS PETROLEUM DISTILLATE. Keep away from heat, sparks and flame. May be irritating to eyes and skin. Do not use product indoors, for exterior use only. Avoid breathing vapors or mist. Use only in areas with adequate ventilation. Wear a vapor/mist respirator during spray applications. If you experience eye watering, headaches or dizziness, increase fresh air or wear respiratory protection (NIOSH/MSHA TC23C or equivalent) or leave the area. Close container after each use. While using do not eat, smoke or drink. Wear protective clothing, gloves and goggles. Do not use on surfaces intended for food, feed, potable water, livestock or dairy animals.

FIRST AID: If swallowed, do not induce vomiting. Call a physician immediately. In case of eye contact, flush immediately with plenty of water for at least fifteen minutes and get medical attention; for skin,



wash thoroughly with soap and water. Remove contaminated clothing and wash before reuse. Call a physician if any irritation persists.

WARNING: This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. Notice: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

KEEP OUT OF REACH OF CHILDREN

SPECIFICATIONS:

| | |
|----------------------------------|---|
| <i>MATERIAL:</i> | Tung oil (China wood oil), Linseed oil, highly refined Paraffin oil |
| <i>SOLVENT:</i> | Mineral Spirits |
| <i>PIGMENT:</i> | Transparent oxide (hydrated ferric oxides) |
| <i>TYPICAL LBS. /GAL.</i> | 7.14 |
| <i>SPECIFIC GRAVITY:</i> | 0.86 |
| <i>VISCOSITY:</i> | 15 SEC. #2 Zahn cup at 77° F. |
| <i>TOTAL SOLIDS by WEIGHT:</i> | 60% |
| <i>TOTAL VOLATILE by WEIGHT:</i> | 40% |
| <i>V.O.C.:</i> | Less than 250 grams/liter (ASTM D-2369) |
| <i>FLASH POINT:</i> | 111° F. (T.C.C) |
| <i>D.O.T. CLASSIFICATION:</i> | Combustible Liquid |

GUARANTEE: If you are not completely satisfied with the performance of this product after applying according to label directions, we will replace the product or refund the purchase price at the manufacturer's option. Proof of purchase, complaint description, and photograph required. Manufacturer's liability limited to refund of purchase price or product replacement. In no event shall manufacturer be responsible for labor, personal injury, or damage.



MATERIAL SAFETY DATA SHEET: DB-2000 Series 250 V.O.C.

PRODUCT NAME: SUPERDECK EXTERIOR TRANSPARENT STAIN
PRODUCT CODE: DB-2000 SERIES, 250 V.O.C.

HMIS CODES: H₂F₂R₀P_H
D.O.T. CLASS: COMBUSTIBLE LIQUID

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: DUCKBACK PRODUCTS
ADDRESS: P.O. BOX 980, 2644 HEGAN LANE, CHICO, CA 95927
CHEM TEL (24 HOUR) EMERGENCY PHONE: (800) 255-3924 **DATE PRINTED:** 05/17/2011
INFORMATION PHONE: (800) 825-5382 **PREPARED BY:** Duckback Products

SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION

| REPORTABLE COMPONENTS: | ACGIH TLV / TWA | CAS NUMBER | VAPOR PRESSURE mm Hg @ TEMP | WEIGHT PERCENT |
|--------------------------------------|----------------------|--------------|--------------------------------|-------------------|
| MINERAL SPIRITS/EXEMPT SOLVENT BLEND | 100 PPM | TRADE SECRET | <5 100 'F | <33 |
| PETROLEUM / VEGETABLE OIL BLEND | N/A | TRADE SECRET | N/A | 30-67 |
| ** COBALT ALKANOATE | .02 MG/M3 (AS METAL) | 136-52-7 | N/A | <. 2 |

** CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III AND OF 40 CFR 372. THIS INFORMATION MUST BE INCLUDED IN ALL MSDS'S THAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL.

WARNING: THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM.

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1 **UPPER:** 7
FLASH POINT: 111 DEG F. **METHOD USED:** TCC
BOILING RANGE: 324 DEG F. **SPECIFIC GRAVITY (H₂O=1):** 0.88
VAPOR DENSITY: HEAVIER THAN AIR **EVAPORATION RATE:** SLOWER THAN ETHER
COATING V.O.C.: <250 GRAMS / LITER **MATERIAL V.O.C.:** < 250 GRAMS / LITER
SOLUBILITY IN WATER: NON SOLUBLE **DENSITY:** 7.37 LB / GAL
APPEARANCE: YELLOWISH TO AMBER LIQUID DEPENDING ON COLOR SELECTED
ODOR: SLIGHT HYDROCARBON ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA: USE WATER FOG, FOAM, DRY CHEMICAL, OR CO₂. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES: USE POSITIVE PRESSURE NIOSH APPROVED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER FOG.

UNUSUAL FIRE AND EXPLOSION PROCEDURES: THIS MATERIAL IS COMBUSTIBLE AND MAY BE IGNITED BY HEAT, SPARKS, FLAMES, OR OTHER SOURCES OF IGNITION. MAY CREATE VAPOR / AIR EXPLOSION HAZARD IN HEAT OF FIRE.

SECTION V - REACTIVITY DATA

STABILITY: STABLE.

CONDITIONS TO AVOID: AVOID SPONTANEOUS COMBUSTION BY SOAKING OILY RAGS, BRUSHES ROLLERS, ETC. IN WATER THEN PLACE INTO A SEALED METAL CONTAINER BEFORE PROPER DISPOSAL. AVOID EXCESSIVE HEAT, POOR VENTILATION, CORROSIVE ATMOSPHERES, AND EXCESSIVE AGING.

INCOMPATIBILITY: (MATERIALS TO AVOID)-ALKALINE MATERIAL, STRONG ACIDS, AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF NITROGEN, TOXIC FUMES OF CHLORINE AND FLUORINE CONTAINING GASES.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.



SECTION VI - ACUTE & CHRONIC HEALTH HAZARDS

INHALATION: VAPORS MAY CAUSE IRRITATION TO NOSE, THROAT, AND RESPIRATORY TRACT. HIGH VAPOR CONCENTRATIONS MAY RESULT IN CENTRAL NERVOUS SYSTEM DEPRESSION.

EYE CONTACT: MAY CAUSE SEVERE IRRITATION, REDNESS, BLURRED VISION AND POSSIBLE CORNEAL INJURY UNLESS WASHED FROM EYES PROMPTLY.

SKIN CONTACT: LIQUID IS SLIGHTLY IRRITATING TO THE SKIN. PROLONGED OR REPEATED LIQUID CONTACT COULD RESULT IN DEFATTING AND DRYING OF THE SKIN, WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INGESTION: INGESTION OF PRODUCT MAY RESULT IN VOMITING. ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY RESULT IN ASPIRATION PNEUMONITIS.

SIGNS & SYMPTOMS: EFFECTS OF OVEREXPOSURE MAY INCLUDE IRRITATION OF THE NOSE AND THROAT, IRRITATION OF THE DIGESTIVE TRACT AND SIGNS OF NERVOUS SYSTEM DEPRESSION INCLUDING HEADACHE, DROWSINESS, DIZZINESS, LOSS OF COORDINATION AND FATIGUE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: PREEXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE.

CARCINOGENICITY:

NTP CARCINOGEN: NO **IARC MONOGRAPHS:** YES **OSHA REGULATED:** NO

SECTION VII - FIRST AID MEASURES

INHALATION: MOVE PERSON TO FRESH AIR. IF BREATHING STOPS, APPLY ARTIFICIAL RESPIRATION AND GET MEDICAL ATTENTION.

EYE: FLUSH IMMEDIATELY WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN AND GET MEDICAL ATTENTION.

SKIN: WASH THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING, WASH BEFORE RE-USE.

INGESTION: DO NOT INDUCE VOMITING. CALL A PHYSICIAN IMMEDIATELY. IF VOMITING OCCURS KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS.

PHYSICIAN NOTE: IF EXCESSIVE AMOUNT HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS, OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VIII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

ELIMINATE IGNITION SOURCES, PROVIDE GOOD VENTILATION, DIKE SPILL AREA AND ADD SUITABLE ABSORBENT TO SPILLED LIQUID, PLACE ABSORBED MATERIAL INTO A SEALED METAL CONTAINER FOR PROPER DISPOSAL.

WASTE DISPOSAL METHOD: DO NOT CONTAMINATE WATER, FOOD, OR FEED BY STORAGE OR DISPOSAL. DISPOSE OF EMPTY CONTAINERS AND ABSORBED SPILL MATERIALS AND ANY UNUSED PRODUCT IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: USE NON-SPARKING UTENSILS WHEN HANDLING THIS MATERIAL. AVOID HOT METAL SURFACES. KEEP CONTAINER CLOSED WHEN NOT IN USE. KEEP AWAY FROM EXCESSIVE HEAT AND FLAMES. **KEEP OUT OF REACH OF CHILDREN.**

OTHER PRECAUTIONS: AVOID SPONTANEOUS COMBUSTION. SUPERDECK CONTAINS DRYING OILS (LINSEED AND TUNG OIL). RAGS, STEEL WOOL, ROLLER COVERS, OR ANY OTHER WASTE SOAKED WITH SUPERDECK MAY SPONTANEOUSLY CATCH FIRE IF IMPROPERLY DISCARDED. IMMEDIATELY AFTER EACH USE, PLACE RAGS, STEEL WOOL, ROLLER COVERS OR ANY OTHER WASTE IN A SEALED WATER FILLED METAL CONTAINER BEFORE PROPER DISPOSAL.

SECTION IX - CONTROL MEASURES

RESPIRATORY PROTECTION: WEAR A VAPOR / MIST RESPIRATOR (**NIOSH / MSHA TC 23C OR EQUIVALENT**) DURING SPRAY APPLICATIONS OR WHEN VENTILATION IS INADEQUATE TO PREVENT INHALATION OVEREXPOSURE.

VENTILATION: GENERAL MECHANICAL VENTILATION OR LOCAL EXHAUST SHOULD BE ADEQUATE TO PREVENT OVEREXPOSURE.

PROTECTIVE GLOVES: WEAR IMPERMEABLE CHEMICAL HANDLING GLOVES FOR SKIN PROTECTION.

EYE PROTECTION: USE CHEMICAL SAFETY GLASSES, GOGGLES, OR FACE SHIELD FOR EYE PROTECTION.



OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

USE IMPERMEABLE APRONS AND PROTECTIVE CLOTHING WHENEVER POSSIBLE TO PREVENT SKIN CONTACT.

WORK / HYGIENIC PRACTICES WHEN USING PRODUCT DO NOT EAT, DRINK, OR SMOKE. WASH HANDS THOROUGHLY AFTER USING.

SECTION X - DISCLAIMER

TO THE BEST OF OUR KNOWLEDGE, THE INFORMATION CONTAINED HEREIN IS ACCURATE, OBTAINED FROM SOURCES BELIEVED BY DUCKBACK PRODUCTS TO BE ACCURATE, BUT IS FURNISHED WITHOUT ANY EXPRESSED OR IMPLIED WARRANTIES.



BENJAMIN MOORE ARBORCOAT WATERBORNE EXTERIOR STAIN

[RELATED SECTION 09 93 13.13]

Model Number: 636 00

Location: Canopy, Great Porch Columns, Interior Floors, Interior Door Trim

Finish: clear coat

Features:

Dries by evaporation, coalescence

Coverage: 400-600² ft.

Density: 7.14 lbs./gal

Viscosity: 62 +/- 2 KU

Gloss, sheen: low luster

Availability: Boone Paint & Interiors





ARBORCOAT®

WATERBORNE EXTERIOR STAIN
PROTECTIVE CLEAR COAT 636

Features

- A clear protective coating for Arborcoat® Transparent (637) and Semi-Transparent (638) stains on deck surfaces
- Functions as an annual refresher coat for Arborcoat® Transparent (637) and Semi-Transparent (638) stains, reviving that newly stained look
- Formulated to protect, and beautify wooden decking and furniture
- Provides mildew resistant coating
- A water repellent coating
- Scuff resistant
- Dual UV protection for Deck systems
- Low lustre finish, can also be used over Arborcoat® Semi-Solid (639)

Recommended For

Residential or commercial applications where a premium quality finish is desired. For exterior use on wood decking, and furniture.

General Description

A premium quality 100% acrylic finish coat for Benjamin Moore® Arborcoat® waterborne exterior stain systems. Use as a protective coating over (637) Transparent and (638) Semi-Transparent Stains on decks or other surfaces where enhanced abrasion resistance and additional protection is desired. Can also be used over (639) Arborcoat® waterborne semi solid stain when a low lustre finish is preferred.

Limitations

- Do not apply when air and surface temperatures are below 40° F (4.4° C).
- High humidity will extend dry and cure times.
- Use only as a topcoat for Arborcoat® transparent, semi transparent or semi solid stains.

Product Information

| | | |
|--|---|--|
| Colors:— Standard: Clear | Technical Data⁰ | Clear |
| —Tint Bases: Not available | Vehicle Type | 100% Acrylic Latex |
| —Special Colors: Contact your Benjamin Moore & Co. representative | Pigment Type | N/A |
| Certification: VOC compliant in all regulated areas | Volume Solids | 25% |
| Technical Assistance Available through your local authorized independent Benjamin Moore® retailer. For the location of the retailer nearest you, call 1-800-828-2623, see www.benjaminmoore.com , or consult your local Yellow Pages. | Coverage per Gallon at Recommended Film Thickness | 400 – 600 Sq. Ft. |
| | Recommended Film Thickness | – Wet Minimal mils – Dry Minimal mils |
| | Depending on surface texture and porosity. Do not apply a rate of less than 300 sq. ft. per gallon. Be sure to estimate the right amount of paint for the job. This will ensure color uniformity and minimize the disposal of excess paint. | |
| | Dry Time @ 77° F (25° C) @ 50% RH | – To Touch 1/2 Hour – To Recoat |
| | High humidity and cool temperatures will result in longer dry, recoat and service times. Allow 24 hours dry time before subjecting decks to normal foot traffic. | |
| | Dries By | Evaporation, Coalescence |
| | Viscosity | 62 ± 2 KU |
| | Flash Point | None |
| | Gloss / Sheen | Low Luster |
| | Surface Temperature at Application | – Min. 40° F – Max. 90° F |
| | Surface must be dry and at least 5° above the dew point. | |
| | Thin With | See Chart |
| | Clean Up Thinner | Clean Water |
| | Weight Per Gallon | 8.6 lbs |
| | Storage Temperature | – Min. 40° F – Max. 90° F |
| | Volatile Organic Compounds (VOC) 79 Grams/Liter .66 lbs./Gallon | |

⁰Reported values are for color shown. Contact Benjamin Moore & Co. for values of other bases or colors.

Surface Preparation

When being used as a refresher coat, remove contamination from weathered stained surfaces by washing with Benjamin Moore® Clean, Multi-Purpose Cleaner (318). Surfaces that were previously stained with Arborcoat® Transparent (637) or Semi-Transparent (638) may be touched up with stain prior to the application of an annual refresher coat of the protective clear coat.

Un-weathered areas such as eaves, ceilings, or overhangs must be washed with Benjamin Moore® Clean, Multi-Purpose Cleaner (318) and/or rinsed with a strong stream from a garden hose to remove surface salts that can interfere with proper adhesion.

WARNING! If you scrape, sand or remove old paint, you may release lead dust. **LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE.** Wear a NIOSH-approved respirator to control lead exposure. Carefully clean up with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead.

Application

Arborcoat® Protective Clear Coat is part of a system. It must be applied over Arborcoat® (637) Transparent or (638) Semi-Transparent Stains when they are used on decks or other horizontal surfaces. The Arborcoat® Protective Clear Coat can be applied 1 to 3 hours after the stain has been applied, depending on temperature and humidity. Can also be used over Arborcoat® Semi-Solid (639) for a low lustre look.

Stir thoroughly before and occasionally during use. Brushing is the preferred method of application. When applied by roller, spray, or dipping, back brushing is recommended to improve uniform distribution. Apply as received in the container. One coat will provide adequate protection; additional coats may lead to a high sheen or uneven gloss.

Start by coating a sample of the exact wood you intend to finish. The finished color and sheen of the stain and clear coat system can vary depending on the type of wood—its natural color, texture, grain porosity, and section of log from which it was cut.

Apply evenly, allowing the stain to penetrate into the wood. Brush from dry into wet areas, stopping at natural breaks, i.e. stairs or edges. To minimize lapping, always maintain a wet edge. On horizontal siding apply the stain on a section of 2 or 3 boards completely across the house. Lower the ladder and continue in the same manner until the side is completed. Vertical siding is coated using the same principle from top to bottom. Never stop staining in mid-wall; continue until a natural break is reached, such as a window.

Do not apply excess amounts as this will result in unwanted gloss and peeling. Do not apply in direct sunlight as this will prevent the product from penetrating properly, causing lap marks.

Apply when air and surface temperatures are between 40° F (4.4° C) and 90° F (32° C).

Thinning/Cleanup

| | | |
|---|---|--|
| Conditioning with Benjamin Moore® 518 Extender may be necessary under certain conditions to adjust open time or spray characteristics. The chart below is for general guidance | | |
| | Mild conditions | Severe conditions |
| | Humid (RH>50%) with no direct sunlight & with little to no wind | Dry (RH<50%), in direct sunlight, or windy conditions |
| Brush: Nylon/Polyester | No Thinning Necessary | Add 518 Extender or water: Max of 8 fl. oz. to a gallon of stain Never add other stains, paints or solvents. |
| Roller: Premium Quality Nylon/Polyester | | |
| Spray: Airless* Pressure: 800 - 1500 psi Tip: 0.011 - 0.015* | | |

Use soap and water.

USE COMPLETELY OR DISPOSE OF PROPERLY. Dry empty containers may be recycled in a can recycling program. Local disposal requirements vary; consult your sanitation department or state-designated environmental agency on disposal options.

Environmental, Health & Safety Information

Use only with adequate ventilation. Do not breathe spray mist or sanding dust. Ensure fresh air entry during application and drying. Avoid contact with eyes and prolonged or repeated contact with skin. Avoid exposure to dust and spray mist by wearing a NIOSH approved respirator during application, sanding and clean up. Follow respirator manufacturer's directions for respirator use. Close container after each use. Wash thoroughly after handling.

WARNING: This product contains a chemical known to the state of California to cause cancer and birth defects, or other reproductive harm.

FIRST AID: In case of eye contact, flush with water for 15 minutes; for skin, wash with soap and water. If you experience difficulty breathing, leave the area to obtain fresh air. If continued difficulty is experienced, get medical attention immediately.

IN CASE OF SPILL — Absorb with inert material and dispose of as specified under "Clean Up".

**KEEP OUT OF REACH OF CHILDREN
PROTECT FROM FREEZING**

**Refer to Material Safety Data Sheet for
additional health and safety information.**



Material Safety Data Sheet

Revision Date: 14-Jul-2009

Revision Number: 1

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name **ARBORCOAT EXTERIOR WATERBORNE PROTECTIVE CLEAR FINISH**

Product Code **636**

Color **Clear**

Manufacturer **Benjamin Moore & Co.**
101 Paragon Drive
Montvale, NJ 07645
Phone: 201-573-9600
www.benjaminmoore.com

Emergency Telephone Number(s)
CHEMTREC: 800-424-9300

2. COMPOSITION INFORMATION ON COMPONENTS

Hazardous Components

| Chemical Name | CAS-No | Weight % (max) |
|------------------------------|----------|----------------|
| Ethanol, 2-(2-butoxyethoxy)- | 112-34-5 | 5 |

3. HAZARDS IDENTIFICATION

Emergency Overview

Vapors may be irritating to eyes, nose, throat, and lungs. May cause skin irritation and/or dermatitis.

Appearance liquid

Odor little or no odor

Potential Health Effects

Principal Routes of Exposure Eye contact, skin contact and inhalation.

Acute Effects

Eyes

May cause slight irritation.

Skin

Substance may cause slight skin irritation.

Inhalation

May cause irritation of respiratory tract.

Ingestion

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic Effects

Repeated contact may cause allergic reactions in very susceptible persons.

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions None known

HMIS Health: 1 Flammability: 0 Reactivity: 0 PPE: -

HMIS Legend

0 - Minimal Hazard

1 - Slight Hazard

2 - Moderate Hazard

3 - Serious Hazard

4 - Severe Hazard

* - Chronic Hazard

X - Consult your supervisor or S.O.P. for "Special" handling instructions.

Note: The PPE rating has intentionally been left blank. Choose appropriate PPE that will protect employees from the hazards the material will present under the actual normal conditions of use.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, Benjamin Moore & Co., has chosen to provide them. HMIS® ratings are to be used only in conjunction with a fully implemented HMIS® program by workers who have received appropriate HMIS® training. HMIS® is a registered trade and service mark of the NPCA. HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

4. FIRST AID MEASURES

| | |
|--------------------|---|
| General Advice | No hazards which require special first aid measures. |
| Eye Contact | Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. |
| Skin Contact | Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. |
| Inhalation | Move to fresh air. If symptoms persist, call a physician. |
| Ingestion | Clean mouth with water and afterwards drink plenty of water. Consult a physician if necessary. |
| Notes To Physician | Treat symptomatically |

5. FIRE-FIGHTING MEASURES

| | |
|---|--|
| Suitable Extinguishing Media | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Protective Equipment And Precautions For Firefighters | As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. |
| Specific Hazards Arising From The Chemical | Closed containers may rupture if exposed to fire or extreme heat. |
| Sensitivity To Mechanical Impact | No |
| Sensitivity To Static Discharge | No |

Flash Point Data

| | |
|--------------------|----------------|
| Flash Point (°F) | Not applicable |
| Flash Point (°C) | Not applicable |
| Flash Point Method | Not applicable |

Flammability Limits In Air

| | |
|-----------------------|----------------|
| Lower Explosion Limit | Not applicable |
| Upper Explosion Limit | Not applicable |

NFPA Health: 1 Flammability: 0 Instability: 0 Special: Not Applicable

NFPA Legend

- 0 - Not Hazardous
- 1 - Slightly
- 2 - Moderate
- 3 - High
- 4 - Severe

The ratings assigned by Benjamin Moore & Co. are only suggested ratings, the contractor/employer has ultimate responsibilities for NFPA ratings where this system is used.

Additional information regarding the NFPA rating system is available from the National Fire Protection Agency (NFPA) at www.nfpa.org.

6. ACCIDENTAL RELEASE MEASURES

| | |
|---------------------------|---|
| Personal Precautions | Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. |
| Environmental Precautions | Prevent further leakage or spillage if safe to do so. |
| Methods For Clean-Up | Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal. |
| Other Information | None known |

7. HANDLING AND STORAGE

| | |
|----------|--|
| Handling | Avoid contact with skin, eyes and clothing. Avoid breathing vapors, spray mists or sanding dust. In case of insufficient ventilation, wear suitable respiratory equipment. |
| Storage | Keep container tightly closed. Keep out of the reach of children. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure Limits****Hazardous Components**

| Chemical Name | ACGIH | OSHA |
|------------------------------|-------|------|
| Ethanol, 2-(2-butoxyethoxy)- | N/E | N/E |

Legend

ACGIH - American Conference of Governmental Industrial Hygienists Exposure Limits

OSHA - Occupational Safety & Health Administration Exposure Limits

NE - Not Established

| | |
|--------------------------------------|--|
| Engineering Measures | Ensure adequate ventilation, especially in confined areas. |
| Personal Protective Equipment | |
| Eye/Face Protection | Safety glasses with side-shields. |
| Skin Protection | Protective gloves and impervious clothing. |
| Respiratory Protection | In case of insufficient ventilation wear suitable respiratory equipment. |
| Hygiene Measures | Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Wash thoroughly after handling. |

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|----------------------------|-------------------|
| Appearance | liquid |
| Odor | little or no odor |
| Density (lbs/gal) | 8.5 - 8.7 |
| Specific Gravity | 0.9 - 1.1 |
| pH | Not available |
| Viscosity (centistokes) | Not available |
| Evaporation Rate | Not available |
| Vapor Pressure | Not available |
| Vapor Density | Not available |
| Wt. % Solids | 20 - 30 |
| Vol. % Solids | 20 - 30 |
| Wt. % Volatiles | 70 - 80 |
| Vol. % Volatiles | 70 - 80 |
| VOC Regulatory Limit (g/L) | < 100 |
| Boiling Point (°F) | 212 |
| Boiling Point (°C) | 100 |
| Freezing Point (°F) | 32 |
| Freezing Point (°C) | 0 |
| Flash Point (°F) | Not applicable |
| Flash Point (°C) | Not applicable |
| Flash Point Method | Not applicable |
| Upper Explosion Limit | Not applicable |
| Lower Explosion Limit | Not applicable |

10. STABILITY AND REACTIVITY

| | |
|---|--|
| Chemical Stability | Stable under normal conditions. |
| Conditions To Avoid | Prevent from freezing |
| Incompatible Materials | No materials to be especially mentioned. |
| Hazardous Decomposition Products | None under normal use. |

Possibility Of Hazardous Reactions

None under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product

No information available

Component

Ethanol, 2-(2-butoxyethoxy)-

LD50 Oral: > 5000 mg/kg (Rat)

LD50 Dermal: 4000 mg/kg (Rabbit)

Chronic Toxicity

Carcinogenicity

There are no known carcinogenic chemicals in this product above reportable levels.

12. ECOLOGICAL INFORMATION

Ecotoxicity Effects

Product

Acute Toxicity to Fish

No information available

Acute Toxicity to Aquatic Invertebrates

No information available

Acute Toxicity to Aquatic Plants

No information available

Component

Acute Toxicity to Fish

No information available

Acute Toxicity to Aquatic Invertebrates

No information available

Acute Toxicity to Aquatic Plants

No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose of in accordance with federal, state, and local regulations. Dry, empty containers may be recycled in a can recycling program. Local requirements may vary, consult your sanitation department or state-designated environmental protection agency for more disposal options.

14. TRANSPORT INFORMATION

DOT Not regulated

ICAO / IATA Not regulated

IMDG / IMO Not regulated

15. REGULATORY INFORMATION

International Inventories

United States TSCA Yes - All components are listed or exempt.
Canada DSL Yes - All components are listed or exempt.

Federal Regulations

SARA 311/312 hazardous categorization

| | |
|-----------------------------------|----|
| Acute Health Hazard | No |
| Chronic Health Hazard | No |
| Fire Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Reactive Hazard | No |

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

This product may contain trace amounts of (other) SARA reportable chemicals. Contact Benjamin Moore & Co. for further information.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product contains the following HAPs:

This product may contain trace amounts of (other) HAPs chemicals. Contact Benjamin Moore & Co. for further information.

State Regulations

California Proposition 65

This product may contain small amounts of materials known to the state of California to cause cancer or reproductive harm.

State Right-to-Know

Legend

X - Listed

16. OTHER INFORMATION

WARNING! If you scrape, sand, or remove old paint, you may release lead dust. LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a NIOSH approved respirator to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead.

Prepared By Product Stewardship Department
Benjamin Moore & Co.
360 Route 206 - P.O. Box 4000
Flanders, NJ 07836
973-252-2593

Revision Date: 14-Jul-2009
Revision Summary Not available

Disclaimer

The information contained herein is presented in good faith and believed to be accurate as of the effective date shown above. This information is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determination of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. Any use of this data and information must be determined by the user to be in accordance with applicable federal, provincial, and local laws and regulations.

End of MSDS

DIVISION 10 **SPECIALTIES**

DAZIAN ECO-TRAPEZE

[RELATED SECTION 10 11 46]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of the Solar Homestead.

Model Number: N143753

Location: Living Module

Dimensions:

Width: 120"

Weight: 19.60 oz. (linear), 5.8 oz. (square)

Finish: white

Available: Dazian


Price: \$24.95/yd



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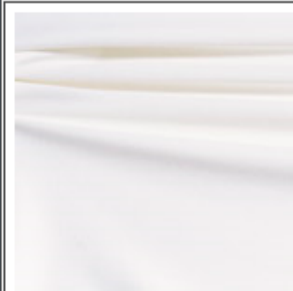
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Eco-Trapeze® *New! Exclusive!*

Stretch Fabrics



[larger image](#)

An environmentally friendly PFR version of our Trapeze® fabric, made from 90% Recycled Polyester/10% Lycra®. Same stretch and washability as our regular Trapeze® product. Each yard of Eco-Trapeze® conserves approximately 61,000 BTU's of energy, equivalent to .5 gallons of gasoline. Recycled Polyester is made from post industrial waste and post consumer plastic bottles. Due to the nature of the raw material used, our Eco products will caste in shade to the off white, a more natural look than the stark white of virgin Polyester.

Special pricing applies to Small Cut/Piece Cuts 0-9 yards. Please call your Sales Representative.

| | |
|-------------------|---|
| Width | 120 Inches |
| Fabric Content | 90% Recycled Polyester / 10% Lycra® |
| Weight (Lin) | 19.60 Ounces |
| Weight (Sq) | 5.8 Ounces |
| Fire Spec | PFR |
| Fire Rating | NFPA 701 Small Scale |
| Care Instructions | Spot clean with commercial cleanser or soap and water, test spot first. |
| Piece Size | 100.00 Yards Approx. |

Available Colors (Click image for larger picture.)

[VIEW CART](#)

| | Color | Price Cut | Price Piece | |
|---|-------|------------|-------------|--|
|  | White | \$24.95/yd | \$19.95/yd | <input type="button" value="REQUEST A SAMPLE"/> <input type="button" value="ORDER"/> |

FR Spec Description

FR - Flame Resistant, Meets NFPA 701 Small Scale
NFR - Not Flame Resistant
CFP - Can Be Flameproofed
IFR - Inherently Flame Resistant, meets NFPA 701 Small Scale
CNFP - Cannot Be Flameproofed
PFR - Permanently Flame Resistant, meets NFPA 701 Small Scale.

Fabric Disclaimer:

Call for samples prior to ordering to assure color accuracy. Colors represented on this website may differ from actual colors of textiles due to photographic and web color processes.

IKEA GRUNDTAL TOILET ROLL HOLDER

[RELATED SECTION 10 28 00]



Model Number: 200.478.98

Location: Core Module Bath and Flex Bath

Dimensions:

Length: 7-1/8"

Width: 4-3/4"

Height: 1-5/8"

Weight: 1 lb

Finish: stainless steel

Available: Ikea

Price: \$4.99

GRUNDTAL

Toilet roll holder, stainless steel

\$4.99

Article Number: 200.478.98

[Read more](#)

Sorry, this product is not for sale on our website, check if it is available in your local store.



Buy at your local store

Store selection may vary and prices may differ from those online.

Matching Products

Product information



GRUNDTAL
Toilet roll holder
\$4.99

Care instructions

Wipe clean with a water dampened soft cloth and a mild non-abrasive dishdetergent or soap, if necessary.

Product description

Stainless steel

Package measurement and weight

Packages: 1
 Article Number: 200.478.98
 Width: 4 3/4"
 Height: 1 5/8"
 Length: 7 1/8"
 Weight: 1lb
 Quantity: 1

Article Number: 200.478.98
 Width: 12 cm
 Height: 4 cm
 Length: 18 cm
 Weight: 0.3 kg
 Quantity: 1

Designer:
Mikael Warnhammar

Product dimensions

Width: 6 3/4 "
 Depth: 4 3/4 "
 Height: 1 1/8 "

Width: 17 cm
 Depth: 12 cm
 Height: 3 cm

More GRUNDTAL bathroom series



[Go to GRUNDTAL bathroom series](#)

More Toilet accessories



[Go to Toilet accessories](#)

Find the Style

[Show matching products](#)

IKEA SAVERN HANGER

[RELATED SECTION 10 28 00]

Model Number: 001.626.67

Location: Core Module Bath

Dimensions:

Length: 4-3/8"

Width: 3"

Height: 1-1/8"

Finish: chrome

Features:

Package contains 2 hangers

Available: Ikea

Price: \$4.99



SÄVERN

Hanger, chrome plated

\$4.99 / 2 pack

Article Number: 001.626.67

Concealed mounting hardware. [Read more](#)

Sorry, this product is not for sale on our website, check if it is available in your local store.

Buy at your local store

Store selection may vary and prices may differ from those online.

Assembly Instructions

[SÄVERN Hanger \(PDF\)](#)



More Models



Matching Products | **Product Information**



SÄVERN
Hanger
\$4.99

Package measurement and weight

Packages: 1
Article Number: 001.626.67
Width: 3"
Height: 1 1/8"
Length: 4 3/8"
Weight: 0lb
Quantity: 1

Care instructions

Wipe clean using a damp cloth and a mild cleaner.
Wipe dry with a clean cloth.

Product description

Main parts: Zinc, Chrome plated
Washer: Silicone rubber
Screw: Stainless steel

More SÄVERN series



[Go to SÄVERN series](#)

More Towel holders



GATCO LATITUDE TOWEL BAR

[RELATED SECTION 10 40 00]



Model Number: 4291

Location: Core Module Bath

Dimensions:

Length: 18"

Width: 2"

Height: 2"

Weight: 10 lb

Finish: satin nickel

Available: Lowes

Price: \$26.48



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Home : Search "gatco latitude bar" : Gatco 18" Latitude 2 Satin Nickel Towel Bar



Gatco 18" Latitude 2 Satin Nickel Towel Bar

Item #: 322224 | Model #:4291

★★★★★ [1 review](#) | [Write a review](#)

\$26.48

Customers Also Viewed



Gatco 24" Latitude 2 Satin Nickel Towel Bar

Not Yet Rated

\$28.48



Gatco 24" Latitude II Satin Nickel Double...

Not Yet Rated

\$43.48



Moen 24" Stockton Brushed Nickel Towel Bar

★★★★★

\$29.98



Moen 18" Stockton Brushed Nickel Towel Bar

Not Yet Rated

\$27.98



Moen 24" Preston Brushed Nickel Towel Bar

★★★★★

\$19.98

[Description](#)

[Specifications](#)

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Color / Finish

Satin Nickel

Number of Bars

1.0

Width (Inches)

2.0

Required Installation Equipment

Drill, Pencil, Screwdriver

Series / Suite

Latitude 2

Finish Family

Nickel

GUARDIAN CB-12 ROOF ANCHOR

[RELATED SECTION 10 40 00]

Model Number: 00645

Location: roof of the Main House and OM Closets

Dimensions:

Height: 12"

Length: 16"

Width: 16"

Features:

Universal base plate

Durable galvanized finish

Fasteners provided for wood and steel

Post extends past roofing substrate to keep attachment point high enough that it is still accessible after the roof is complete

Round post works with most off-the-shelf flashing kits

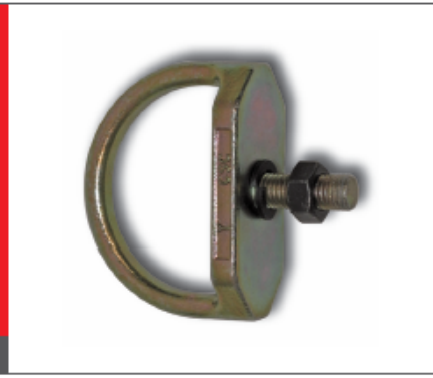
Available: Guardian Fall Protection



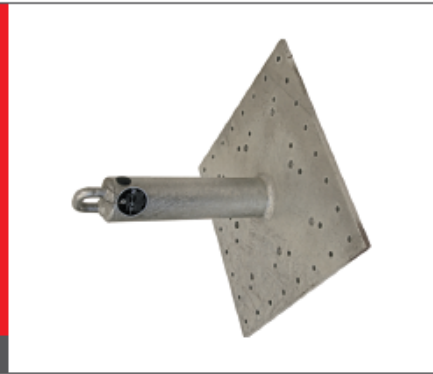
ANCHOR POINTS

COMMERCIAL ANCHOR POINTS

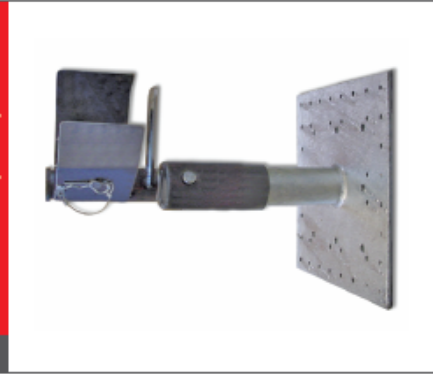
1 D-BOLT ANCHORS



2 CB-12 & CB-18



3 CB SWIVEL TOP (00680)



D-BOLT ANCHORS (00370 & 00373)

D-Bolt Anchors are designed as the intermediary for securing a connecting device to an anchorage point.

*00373 includes 1½" long integrated 9/16" bolt, nut & lock washer

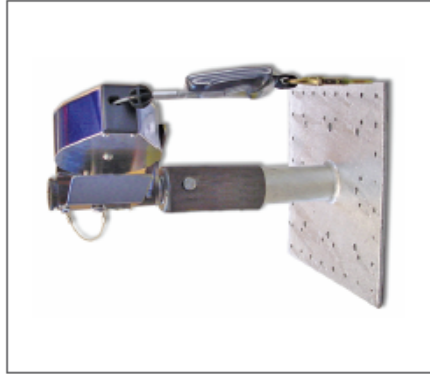
CB-12 & CB-18 (00645 & 00656)

- Universal base plate
- Durable galvanized finish
- Fasteners provided for wood & steel
- CB-12 is for use on wood, steel or concrete
- Post extends past roofing substrate to keep attachment point high enough that it is still accessible after the roof is complete
- Round post works with most off-the-shelf flashing kits
- Great for use with retractable or horizontal lifeline systems
- CB-18 is for concrete or special application only
- Custom design and fabrication available
- Available in stainless steel

• CB Series can be used in and as HILL system

CB SWIVEL TOP SYSTEM (00680)

- Mounts on top of the CB-12 or CB-18
- Easy installation
- Swivels 360°
- Removable and reusable bolt on application
- Cost effective accessory to the CB
- Great for first-worker-up system
- Does not include CB or retractable



| Part # | Description | Size | Weight |
|--------|--|-------------------------|--------|
| 00370 | Forged Anchorage Connector (does not include bolt) | ½" Hole | 3.50 |
| 00371 | Forged Anchorage Connector (does not include bolt) | 5/8" Hole | 3.50 |
| 00372 | Forged Anchorage Connector (does not include bolt) | ¾" Hole | 3.50 |
| 00373 | Forged Anchorage Connector (includes bolt) | 9/16" Hole | 3.50 |
| 00645 | CB-12 for Wood/Steel/Concrete | 12" Post 16" x 16" Base | 35.70 |
| 00656 | CB-18 for Concrete | 18" Post 12" x 12" Base | 31.40 |
| 00680 | CB Swivel Top System | | 12.40 |

GUARDIAN D-BOLT ANCHORS

[RELATED SECTION 10 40 00]

Model Number: 00370

Location: Great Porch Canopy

Weight: 3.5 lbs

Features:

- 5/8" hole

- Intermediary for securing a connecting device to an anchorage point

Available: Guardian Fall Protection



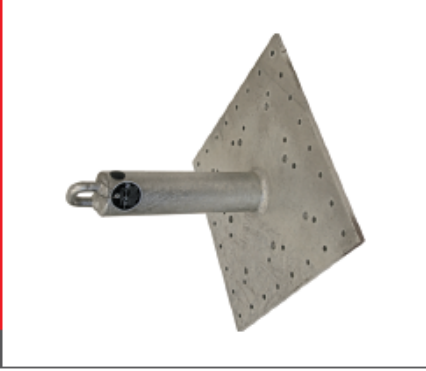
ANCHOR POINTS

COMMERCIAL ANCHOR POINTS

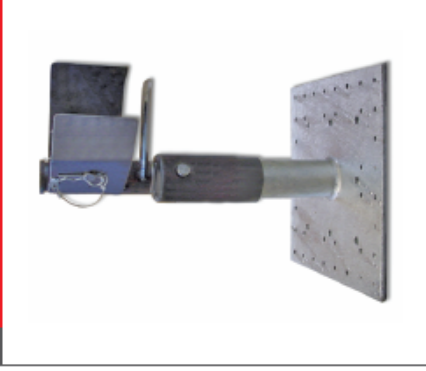
1 D-BOLT ANCHORS



2 CB-12 & CB-18



3 CB SWIVEL TOP (00680)



D-BOLT ANCHORS (00370 & 00373)

D-Bolt Anchors are designed as the intermediary for securing a connecting device to an anchorage point.

*00373 includes 1 1/2" long integrated 9/16" bolt, nut & lock washer

CB-12 & CB-18 (00645 & 00656)

- Universal base plate
- Durable galvanized finish
- Fasteners provided for wood & steel
- CB-12 is for use on wood, steel or concrete
- Post extends past roofing substrate to keep attachment point high enough that it is still accessible after the roof is complete
- Round post works with most off-the-shelf flashing kits
- Great for use with retractable or horizontal lifeline systems
- CB-18 is for concrete or special application only
- Custom design and fabrication available
- Available in stainless steel
- **CB Series can be used in and as HILL system**

CB SWIVEL TOP SYSTEM (00680)

- Mounts on top of the CB-12 or CB-18
- Easy installation
- Swivels 360°
- Removable and reusable bolt on application
- Cost effective accessory to the CB
- Great for first-worker-up system
- Does not include CB or retractable



| Part # | Description | Size | Weight |
|--------|--|-------------------------|--------|
| 00370 | Forged Anchorage Connector (does not include bolt) | 1/2" Hole | 3.50 |
| 00371 | Forged Anchorage Connector (does not include bolt) | 5/8" Hole | 3.50 |
| 00372 | Forged Anchorage Connector (does not include bolt) | 3/4" Hole | 3.50 |
| 00373 | Forged Anchorage Connector (includes bolt) | 9/16" Hole | 3.50 |
| 00645 | CB-12 for Wood/Steel/Concrete | 12" Post 16" x 16" Base | 35.70 |
| 00656 | CB-18 for Concrete | 18" Post 12" x 12" Base | 31.40 |
| 00680 | CB Swivel Top System | | 12.40 |

DIVISION 11 **EQUIPMENT**

TOSHIBA LAPTOP COMPUTER

[RELATED SECTION 11 28 13]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of The Solar Homestead.

Model Number: L670D-ST2N04

Location: Main House

Dimensions:

Depth: 1-1/2"

Width: 16-1/4"

Height: 10-1/2"

Finish: black

Features:

AMD Turion II Dual-Core Processor P560

Operating system: Genuine Windows 7 Home Premium

Graphics engine: ATI Mobility Radeon HD 4250

Memory: 4GB DDR3 1066 MHz memory

Hard drive: 500 GB HDD [5400 rpm]

Display size: 17.3" widescreen

Audio: standard stereo speakers, microphone jack, headphone jack

Communication: webcam and microphone built into LCD bezel

Wi-Fi wireless networking

Electrical:

Wattage: 65 auto-sensing

Voltage: 100-240/ 50-60 Hz input

Battery: Li-Ion [48Wh, 6-Cell]

Approval Certificates:

Energy Star Qualified

RoHS Compliant

EPEAT Gold

Available: Toshiba

Price: \$699.00





Satellite L670D-ST2N04

MSRP+: **\$699.00**

Average Customer Rating: ★★★★★
Read Reviews (14)



We recommend taking a look at other Satellite L670s that are available:

[Satellite L670 Series >](#)

Laptop Accessories

Shop for [Satellite L670D-ST2N04 accessories](#) at ToshibaDirect.com.

Technical Support

Get [support](#) for your [Satellite L670D-ST2N04](#) or try our [Laptop Forums](#) for additional help.



Specifications

Features

Image Gallery

Customer Reviews

Satellite L670D-ST2N04 Laptop Specifications

[download detailed spec sheet PDF](#)

Performance

PROCESSOR*
AMD Turion™ II Dual-Core Mobile Processor P560

OPERATING SYSTEM*
Genuine Windows 7 Home Premium (64-bit)*

GRAPHICS ENGINE*
ATI® Mobility Radeon™ HD 4250

GRAPHICS MEMORY*
256MB-1917MB dynamically allocated shared graphics memory

Expansion

PC EXPRESS SLOT
No PC Express Slot

SMARTCARD READER
No SmartCard Reader slot

MEDIA
Memory Card Reader

USB PORTS*
2-USB (2.0) ports, 1-eSATA/USB combo port*

HDMI
HDMI output port

Accessories for the Satellite L670D-ST2N04



[Carrying Cases](#)
[Batteries](#)
[AC Adapters](#)
[Memory](#)
[Docking & Expansion](#)

Satellite L670D Detailed Product Specification¹

Model Name: L670D-ST2N04

Part Number: PSK3JU-08R031

UPC: 883974711529

Operating System ²

- Genuine Windows[®] 7 Home Premium 64-bit

Processor³ and Graphics⁴

Vision Technology from AMD-Premium

- AMD Turion™ II Dual-Core Mobile Processor P560
 - 2.5 GHz, 2MB L2 Cache
- AMD M880G Chipset
- ATI Mobility Radeon™ HD 4250 Graphics with 256MB-1917MB dynamically allocated shared graphics memory

Memory⁵

- Configured with 4GB DDR3 1066MHz (max 8GB)
- 2 main memory slots. Both slots occupied.

Storage Drive⁶

- 500GB (5400 RPM); Serial ATA hard disk drive

Fixed Optical Disk Drive⁷

- DVD SuperMulti drive with Labelflash[®] supporting 11 formats
 - Maximum speed and compatibility: CD-ROM (24x), CD-R (24x), CD-RW (24x), DVD-ROM (8x), DVD-R (8x), DVD-R DL (8x), DVD-RW (8x), DVD+R (8x), DVD+R DL (8x), DVD+RW (8x), DVD-RAM (5x)
 - Supports Labelflash[®] media to burn high quality labels directly on the disc

Display⁸

- 17.3" diagonal widescreen TruBrite[®] TFT display at 1600 x 900 native resolution (HD+)
 - Native support for 720p content
 - 16:9 aspect ratio
 - LED backlit

Sound

- Built-in stereo speakers
- DOLBY[®] Advanced Audio™

Input Devices

- Standard Keyboard with 10-KeyPad (black)
- Touch pad pointing device with multi-touch control
- Touch pad Enable/Disable

Communications

- Webcam and microphone
- 10/100 Ethernet
- Wi-Fi[®] Wireless networking (802.11b/g/n)⁹
- Bluetooth[®] version 2.1 plus Enhanced Data Rate (EDR)

Expandability

- Memory Card Reader
 - Secure Digital, SDHC, miniSD, Memory Stick™, Memory Stick PRO™, Multi Media Card [shared slot-adaptor may be required]

Ports

- Video
 - RGB
 - HDMI
- Audio
 - Microphone input port
 - Headphone output port
- Data
 - 3 USB v2.0 ports (2 USB + 1 eSATA/USB combo)
 - RJ-45 LAN port
- Security
 - Slot for Security Lock

Physical Description

- Fusion[®] Finish in Helios Black
- Dimensions (W x D x H Front/H Rear): 16.2" x 10.6" x 1.10"/1.49" without feet
- Weight: Starting at 6.61 lbs., depending upon configuration¹⁰

Power

- 65W (19V 3.42A) 100-240V/50-60Hz AC Adapter.
 - Dimensions (W x H x D): 4.21" x 1.85" x 1.20"
 - Weight: starting at 0.55 lbs.

Battery¹¹

- 6 cell/48Wh Lithium Ion battery pack,
- Battery Life Rating (measured by MobileMark™ Productivity 2007)¹²
 - Included 6 cell battery: 3 hours, 44 minutes

Software ¹³

- TOSHIBA App PlaceSM
- TOSHIBA Assist
- TOSHIBA BookPlace™
- TOSHIBA Bulletin Board
- TOSHIBA Disc Creator
- TOSHIBA eco Utility™
- TOSHIBA Face Recognition
- TOSHIBA HDD/SSD Alert
- TOSHIBA HW Setup Utility
- TOSHIBA Laptop Checkup
- TOSHIBA Media Controller¹⁴
- TOSHIBA Password Utility
- TOSHIBA PC Health Monitor
- TOSHIBA Recovery Disc Creator
- TOSHIBA ReelTime
- TOSHIBA Service Station
- TOSHIBA Supervisor Password Utility
- TOSHIBA Value Added Package
- TOSHIBA Web Camera Application
- Third-party Software
 - Adobe[®] Acrobat[®] Reader
 - Google[®] Toolbar
 - Google[®] Chrome
 - Corel Label @Once
 - Internet Explorer 8
 - Microsoft[®] Office Starter 2010¹⁵
 - Microsoft[®] Windows Media Player 12
 - Microsoft[®] Silverlight™
 - Microsoft[®] Live Essentials
 - Photo Gallery
 - Messenger
 - Mail
 - Writer
 - Movie Maker
 - WildTangent[®] Games Console
- Special Offers and Trial Software
 - NetZero[®] Internet Service
 - Norton Internet Security™ 2011 (30-day trial subscription)
 - Skype[®]
 - Toshiba Online Backup (30-day trial subscription)

Environmental Specifications

- This product is RoHS¹⁶ compatible
- Energy Star Qualified
- EPEAT™ Gold Compliant

| | Operating | Non-operating |
|---------------------------|----------------------|----------------------|
| Temperature ¹⁷ | 5° to 35° C | -20° to 60° C |
| Thermal Gradient | 15° C per hour (max) | 20° C per hour (max) |
| Relative Humidity | 20% to 80% | 10% to 95% |

| (non-condensing) | | |
|-------------------------------------|-------------------|--------------------|
| Altitude (relative to sea level) | 0 to 3,000 meters | 0 to 10,000 meters |
| Shock | 10G | 80G |
| Vibration | 0.5G | 1.0G |

1 YEAR STANDARD LIMITED WARRANTY¹⁸

- Includes International Limited Warranty for obtaining service when traveling outside the United States.

Service Upgrades and Extensions

Toshiba offers many different enhanced services such as SystemGuard®, On-Site Repair, and ServiceExpress to provide additional support to your notebook PC. For a full description and complete list of programs and program terms and conditions, please visit www.pcsupport.toshiba.com.

Accessories

For additional and most updated accessories, please visit www.accessories.toshiba.com

Memory Upgrade

| Part Number | Description |
|--------------|-------------------------------------|
| PA3877U-1M4G | Toshiba 4GB DDR3-1066 Memory Module |

Power

| Part Number | Description |
|--------------|--|
| PA3717U-1ACA | Toshiba 120W Global AC Adapter |
| PA3818U-1BRS | Toshiba Primary Li Ion Battery Pack (8 cell) |

| | |
|--------------|---|
| PA3819U-1BRS | Toshiba Primary High Capacity Li Ion Battery Pack (12 cell) |
|--------------|---|

Expansion

| Part Number | Description |
|--------------|---|
| PA3778U-1PRP | dynadock V USB Docking Station with DVI/VGA port |
| PA3575U-1PRP | dynadock U USB Docking Station with DVI/VGA port |
| PA3688U-1SET | dynadock Wireless U Docking Station with Wireless USB Adapter |

Storage

| Part Number | Description |
|---------------|---|
| PA3879U-1M4S | Toshiba 4GB USB Micro Flash Drive |
| PA3879U-1M8S | Toshiba 8GB USB Micro Flash Drive |
| PA3879U-1MAS | Toshiba 16GB USB Micro Flash Drive |
| E05A050CAU2XK | Toshiba 500GB USB 2.0 Portable Hard Drive, Raven Black |
| E05A075PBU2XK | Toshiba 750GB USB 2.0 Portable Hard Drive, Raven Black |
| E05A100PBU3XW | Toshiba 1TB USB 3.0 Portable Hard Drive, Black with White accents |

Expansion

| Part Number | Description |
|--------------|--|
| PA3710U-1BTM | Toshiba Bluetooth V 2.1+EDR USB Nano Adapter |

Carrying Case

| Part Number | Description |
|--------------|---|
| PA1464U-1SP8 | Toshiba 18.4" Metropolitan Carrying Case (Fits up to 18.4") |
| PA1500U-1BS8 | Toshiba 18.4" Extreme Backpack (Fits up to 18.4") |

Subject to Change

While Toshiba has made every effort at the time of publication to ensure the accuracy of the information provided herein, product specifications, configurations, prices, system/component/options availability are all subject to change without notice. For the most up-to-date product information about your computer, or to stay current with the various computer software or hardware options, visit Toshiba's Web site at <http://www.pcsupport.toshiba.com>

Return Policy

Notwithstanding anything to the contrary in any third party License Agreement or product documentation supplied with your PC, Toshiba America Information Systems, Inc. ("TAIS") does not accept the return of component parts, or bundled software, that have been removed from the PC system. Pro-rata refunds on individual PC components or bundled software, including the operating system, will not be granted. If you wish to return a complete PC system, contact the TAIS dealer where you purchased the product, and comply with the dealer's standard return policies and procedures.

Toshiba America Information Systems, Incorporated ("TAIS")

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Irvine CA 92618

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¹⁸ 64-bit computing:

64-bit computing requires that the following hardware and software requirements are met:

- 64-bit Operating System
- 64-bit CPU, Chipset and BIOS (Basic Input/Output System)
- 64-bit Device drivers
- 64-bit applications

Certain device drivers and/or applications may not be compatible with a 64-bit CPU and therefore may not function properly. See "Detailed Specs" for more information.

¹ **Product Series Legal Footnote.** The product specifications and configuration information are designed for a product Series. Your particular model may not have all the features and specifications listed or illustrated. For more detailed information about the features and specifications on your particular model, please visit Toshiba's Web site at pcsupport.toshiba.com.

Product Offering Legal Footnote. Toshiba America Information Systems, Inc. reserves the right to modify or withdraw this offer at anytime without notice

² **Operating System.**

Also see **64-Bit Computing Legal Footnote**, if applicable.

Certain Microsoft® software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by internet or telephone (toll charges may apply).

Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Offers. Offer terms, duration and product availability all subject to change without notice

³ **Processor (Central Processing Unit).** Also see **64-Bit Computing Legal Footnote**, if applicable.

CPU performance in your computer product may vary from specifications under the following conditions:

1. use of certain external peripheral products
2. use of battery power instead of AC power
3. use of certain multimedia, computer generated graphics or video applications
4. use of standard telephone lines or low speed network connections
5. use of complex modeling software, such as high end computer aided design applications
6. use of several applications or functionalities simultaneously
7. use of computer in areas with low air pressure (high altitude >1,000 meters or >3,280 feet above sea level)
8. use of computer at temperatures outside the range of 5°C to 30°C (41°F to 86°F) or >25°C (77°F) at high altitude (all temperature references are approximate and may vary depending on the specific computer model – please visit the Toshiba website at www.pcsupport.toshiba.com for details).

CPU performance may also vary from specifications due to design configuration.

Under some conditions, your computer product may automatically shut-down. This is a normal protective feature designed to reduce the risk of lost data or damage to the product when used outside recommended conditions. To avoid risk of lost data, always make back-up copies of data by periodically storing it on an external storage medium. Use your computer product only under recommended conditions. Read additional restrictions under "Environmental Conditions" in your product "Detailed Specs." Contact Toshiba Technical Service and Support for more information.

⁴ **Graphics (Graphics Processing Unit).** GPU performance may vary depending on product model, design configuration, applications, power management settings and features utilized. GPU performance is only optimized when operating in AC power mode and may decrease considerably when operating in battery power mode.

Total Available Graphics Memory is the total of, as applicable, Dedicated Video Memory, System Video Memory and Shared System Memory. Shared System Memory will vary depending on system memory size and other factors.

⁵ **Memory (Main System).** Part of the main system memory may be used by the graphics system for graphics performance and therefore reduce the amount of main system memory available for other computing activities. The amount of main system memory allocated to support graphics may vary depending on the graphics system, applications utilized, system memory size and other factors. Computers configured with a 32-bit operating system can address up to 3GB of system memory. Only computers configured with a 64-bit operating system can address 4 GB or more of system memory.

⁶ **Storage Drive**

Computer (Internal) HDD Capacity. One Gigabyte (GB) means $10^9 = 1,000,000,000$ bytes using powers of 10. The computer operating system, however, reports storage capacity using powers of 2 for the definition of 1 GB = $2^{30} = 1,073,741,824$ bytes, and therefore shows less storage capacity. Available storage capacity will also be less if the computer includes one or more pre-installed operating systems, such as Microsoft Operating System and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

⁷ **Optical Drive.** Due to manufacturing and quality variations in third party optical media (e.g., CD or DVD) or optical media players/recorders, in certain cases, your Toshiba optical drive may not record on certain optical media that bear the applicable logo, or playback optical media recorded by other PCs or optical media recorders. Additionally, certain optical media recorded on your optical drive may not playback or operate properly on other PCs or optical media players. These problems are not due to any defect in your Toshiba PC or optical drive. Please refer to your PC's product specification for listing of specific format compatibilities.

Recording or viewing of certain optical media may be limited or prevented in accordance with applicable copy protection standards.

⁸ **Display.** Small bright dots may appear on your screen display when you turn on your PC. Your display contains an extremely large number of thin-film transistors (TFT) and is manufactured using high-precision technology. Any small bright dots that may appear on your display are an intrinsic characteristic of the TFT manufacturing technology. Over a period of time, and depending on the usage of the computer, the brightness of the screen will deteriorate. This is also an intrinsic characteristic of the screen technology. When the computer is operated on battery power, the screen will dim and you may not be able to increase the brightness of the screen while on battery power.

⁹ **Wireless-N.** The wireless adapter is based on a draft release version of the IEEE 802.11n specification, and may not be compatible with, or support all features (e.g., security) of, certain Wi-Fi® equipment.

¹⁰ **Weight.** Weight may vary depending on product configuration, vendor components, manufacturing variability and options selected.

¹¹ **Battery Life Rating.** Measured by MobileMark® 2007. MobileMark is a trademark of the Business Applications Performance Corporation. Rating based on either MobileMark Productivity 2007 modeling a user performing common mobile office activities or Reader 2007 modeling a user reading documents. See "Detailed Specifications" for test used.

Details of MobileMark 2007 testing are available at www.bapco.com

Rating is for comparison purposes only, and does not indicate the battery life that will be obtained by any individual user. Actual battery life may vary considerably from specifications depending on product model, configuration, applications, power management settings and features utilized, as well as the natural performance variations produced by the design of individual components. The battery life rating is only achieved on the select models and configurations tested by Toshiba under the specific test settings at the time of publication and is not an estimate of a system's battery life under any conditions other than the specific test settings.

After a period of time, the battery will lose its ability to perform at maximum capacity and will need to be replaced. This is normal for all batteries

¹² **Battery Life - MobileMark™.** Measured by MobileMark. MobileMark is a trademark of the Business Applications Performance Corporation.

¹³ **Software.** Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Certain Microsoft® software products (including Microsoft Office Small Business Accounting if applicable) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software products or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply).

Internet access is required to enable certain functionality of certain Microsoft products (including Microsoft Office Small Business Accounting 2006) which may be included with this computer.

Includes Microsoft® Office 2010 preloaded. Purchase a Product Key to activate a full Microsoft Office 2010 suite.

¹⁴ **Toshiba Media Controller.** Copy protection technology, if any, associated with the content may prevent or limit sharing of content.

¹⁵ **Microsoft Office Starter 2010.** Office Starter consists of reduced-functionality versions of Word and Excel with advertising. PowerPoint, Outlook, OneNote, Access and Publisher are not included.

¹⁶ **RoHS.** This notebook is compatible with European Union Directive 2002/95/EC, Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS), which restricts use of lead, cadmium, mercury, hexavalent chromium, PBB, and PBDE. Toshiba requires its notebook component suppliers to meet RoHS requirements and verifies its suppliers' commitment to meeting RoHS requirements by conducting component sampling inspections during the product design approval process.

¹⁷ **Temperature (Environmental) Conditions.** All temperature references are approximate and the performance of your computer may vary from specifications even when operating within the recommended temperature range.

¹⁸ **Warranty.** The terms and conditions of Toshiba's standard limited warranty are available at www.warranty.toshiba.com.

LG 3-DOOR FRENCH DOOR REFRIGERATOR

[RELATED SECTION 11 31 13]

Model Number: LFC21776ST

Location: Living Module

Dimensions:

Width: 35-3/4"

Height: 69-3/4"

Depth: 30"

Weight: 278 lbs

Finish: Stainless Steel

Features:

Total Capacity: 20.7 cu. ft.

Freezer Type: Pull-out Drawer

Refrigerator Capacity: 14.7 cu. ft.

Freezer Capacity: 6.0 cu. ft.

Counter Depth [in.]: 23 5/8" [Depth Less Door]

Multi-Air Flow Cooling: Yes

Temperature Controls: Internal LED Touch Pad

LoDecibel™ Operation: Yes

LED Interior Light: Yes

Shelf Construction: Spill Protector™ Tempered Glass

Crisper Bins: 2 Humidity Crispers / 1 Bonus Drawer

Foam Door Insulation: Yes

Hidden Hinges: Yes

Toe Grille: Yes

Approval Certificates:

Energy Star Qualified

Available: The Home Depot

Price: \$2,199.00





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LG Electronics 20.7 cu. ft. French Door Refrigerator

Model # LFC21776ST Internet # 202362228
Store SO SKU # 646992

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Rebate Available [Learn More](#)

This item cannot be shipped to the following state(s): AK,HI

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Description

Specifications

Reviews

More Info

Parts & Services

- ADA Compliant : No
- Adjustable Door Bin Description : 6 Door Bins, 5 Adjustable Gallon Size
- Adjustable Door Storage : Yes
- Appliance Cabinet Color : Stainless
- Assembled Depth (in.) : 30 in
- Assembled Height (in.) : 69.75 in
- Assembled Width (in.) : 35.75 in
- Built In : No
- Built-in Wine Rack : No
- Can Dispenser : No
- Capacity (cu. ft.) : 20.7 ft³
- Capacity Range (cu. ft.) : 18 - 21
- Color/Finish : Stainless Steel
- Color/Finish Family : Stainless

REFRIGERATOR

LFC25776

3 Door French Door Refrigerator

HIGHLIGHTS

Sophisticated Style & Design
10-Yr Warranty on Linear Compressor
Energy Star / CEE Tier 3

STYLE AND DESIGN

- LFC25776 – 25.0 cu.ft.
LFC21776 – 20.7 cu.ft (Counter Depth)
- French Door Refrigerator with Bottom Freezer
- Premium Finishes in Stainless Steel, Smooth White and Smooth Black
- Contoured Doors with Matching Commercial Handles
- Hidden Hinges
- Premium LED Interior Light

ORGANIZATION

- 4 Slide-Out, Spill Protector™ Tempered Glass Shelves
- Glide N' Serve™ Drawer
- 2 Humidity Crispers/1 Bonus Drawer
- 6 Door Baskets (5 Adjustable Gallon Size) and Dairy Corner
- Utility Bin
- Freezer Drawer with Full Width DuraBase™ inside

PERFORMANCE

- Energy Star/CEE Tier 3, uses 30% Less Energy than Federal Standards
- Linear Compressor for Better Energy, Quiet Operation, and Durability
- Multi-Air Flow Cooling
- Internal LED Touch Pad Digital Temperature Controls
- IcePlus™ Accelerated Freezing Function
- Door Alarm
- LoDecibel™ Quiet Operation with Linear Compressor

Sophisticated Style & Design

Contoured doors, hidden hinges, and a host of great interior features give your refrigerator a look as sophisticated as it is functional.



BEAUTIFUL ON THE INSIDE. BEAUTIFUL ON THE OUTSIDE.

A lot of thought went into this LG refrigerator. On the outside – contoured doors, hidden hinges and commercial steel handles. And Inside is enhanced LED lighting and an integrated 4-compartment crisper system with a full width Glide N' Serve™ drawer.

10-Year Warranty on Linear Compressor

When you buy a refrigerator, you don't want to worry that it won't last. Because the Linear Compressor uses fewer moving parts and operates more efficiently, LG confidently backs the compressor with a 10-year warranty.

Energy Star / CEE Tier 3

When your refrigerator uses at least 30% less energy than required by federal standards you're going to make an impact – on your energy bill, your energy consumption, and most importantly, the environment.

REFRIGERATOR

LFC25776



CAPACITY - LFC25776

| | |
|--------------|-------------|
| Refrigerator | 17.7 cu.ft. |
| Freezer | 7.3 cu.ft. |
| Total | 25.0 cu.ft. |

CAPACITY - LFC21776 (Counter Depth)

| | |
|--------------|-------------|
| Refrigerator | 14.7 cu.ft. |
| Freezer | 6.0 cu.ft. |
| Total | 20.7 cu.ft. |

FEATURES

| | |
|------------------------------|------------------------|
| Energy Rating | Energy Star |
| Freezer Door Type | Drawer |
| Multi-Air Flow Cooling | • |
| Digital Temperature Controls | Internal LED Touch Pad |
| Digital Temperature Sensors | 5 |
| LoDecibel™ Operation | • |
| Door Alarm | • |

REFRIGERATOR

| | |
|------------------------|------------------------------------|
| No. of Shelves | 4 Split |
| Slide-Out Shelves | 4 |
| Cantilevered Shelves | • |
| Shelf Construction | Spill Protector™ Tempered Glass |
| Crisper Bins | 2 Humidity Crispers/1 Bonus Drawer |
| Glide N' Serve™ Drawer | • |
| Utility Bin | 2 Piece Bin (with cover) |
| Refrigerator Light | Premium LED |

REFRIGERATOR DOOR

| | |
|--------------------|------------------------------|
| No. of Shelves/Bin | 6 (5 Adjustable Gallon Size) |
| Dairy Corner | • |

FREEZER

| | |
|-----------------------------|---------------------------|
| Drawers | 2 |
| Wire Drawer | • |
| DuraBase™ Solid Drawer Base | • |
| Divider | • |
| Freezer Door Bin | 1 Tilting (LFC25776 only) |
| IcePlus™ | • |
| Ice Bin | • |
| Freezer Light | 60W |

MATERIALS AND FINISHES

| | |
|-----------------------------|---|
| Foam Door Insulation | • |
| Contour Doors | • |
| Hidden Hinges | • |
| Toe Grille | • |
| Surface | Coated Metal, Stainless Steel |
| Back | Flush & Metal cover over mechanical parts |
| Available Colors (LFC25776) | Smooth White (SW), Smooth Black (SB), Stainless Steel (ST) |
| Available Colors (LFC21776) | Stainless Steel (ST) |
| Handles | Matching Commercial Handles |

DIMENSIONS/CLEARANCES/WEIGHT - LFC25776

| | |
|--------------------------------------|-----------------------------|
| Depth with Handles | 34 1/4" |
| Depth without Handles | 31 3/4" |
| Depth without Door | 27 7/8" |
| Depth (Total with Door Open) | 46 1/2" |
| Height to Top of Case | 68 3/8" |
| Height to Top of Door Hinge | 69 3/4" |
| Width | 35 3/4" |
| Width (Door Open 90° with Handle) | 44 1/4" |
| Width (Door Open 90° without Handle) | 39 1/4" |
| Door Edge Clearance with Handle | 4 1/2" |
| Door Edge Clearance without Handle | 1 3/4" |
| Installation Clearance | Sides 1/8", Top 1", Back 1" |
| Weight (Unit/ Carton) | 302 lbs./355 lbs. |
| Carton Dimensions (WxHxD) | 38" x 73" x 37" |

DIMENSIONS/CLEARANCES/WEIGHT - LFC21776

| | |
|--------------------------------------|-----------------------------|
| Depth with Handles | 30" |
| Depth without Handles | 27 1/2" |
| Depth without Door | 23 5/8" |
| Depth (Total with Door Open) | 42 1/4" |
| Height to Top of Case | 68 3/8" |
| Height to Top of Door Hinge | 69 3/4" |
| Width | 35 3/4" |
| Width (Door Open 90° with Handle) | 44 1/4" |
| Width (Door Open 90° without Handle) | 39 1/4" |
| Door Edge Clearance with Handle | 4 1/2" |
| Door Edge Clearance without Handle | 1 3/4" |
| Installation Clearance | Sides 1/8", Top 1", Back 1" |
| Weight (Unit/ Carton) | 278 lbs./333 lbs. |
| Carton Dimensions (WxHxD) | 38" x 73" x 33" |

WARRANTY

1 Year Parts and Labor,
7 Years on the Sealed System,
10 Years on Linear Compressor

UPC CODES

| | | |
|------------|---------------------------------|---------------|
| LFC25776SW | Smooth White | 048231 783569 |
| LFC25776SB | Smooth Black | 048231 783576 |
| LFC25776ST | Stainless Steel | 048231 783583 |
| LFC21776ST | Counter Depth - Stainless Steel | 048231 783811 |



www.LG.com

LG Electronics U.S.A., Inc.
1000 Sylvan Avenue Englewood Cliffs, NJ 07632
Customer Service and Technical Support: (800) 243-0000

Dimensions and weights are approximate. Design, features and specifications subject to change without notice.

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BOSCH INDUCTION COOKTOP WITH TOUCH CONTROL**[RELATED SECTION 11 31 13]**

Model Number: NIT3065UC

Location: Living Module

Dimensions:

Width: 31"

Height: 1/4" + 4-1/8"

Depth: 21-1/4"

Weight: 39 lbs

Features:

Number of induction elements: 4

Total number of cooktop burners: 4

Front Left Heating Element: 2.2kW, 9" Diameter

Back Left Heating Element: 1.4kW, 6" Diameter

Back Right Heating Element: 2.4kW, 11" Diameter

Front Right Heating Element: 1.4kW, 11" Diameter

Burners with Booster: All

Minimum Distance from Counter Front: 2 1/4"

Minimum Distance from Rear Wall: 2"

Power Cord Length: 37"

Electrical:

Watts: 7,200 W

Current: 40 A

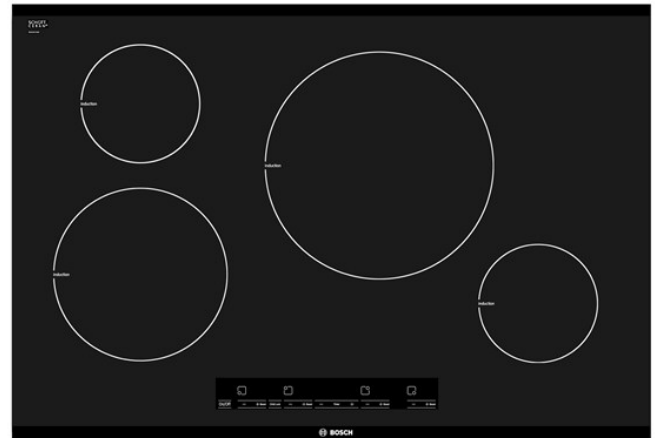
Volts: 208-240 V

Frequency: 60 Hz

Approval Certificates:

CSA

Available: Lowes





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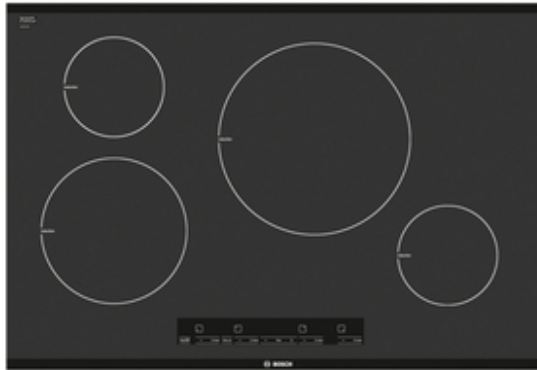
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Bosch 30-Inch Smooth Surface Electric Cooktop (Color: Black)

Item #: 122529 | Model #:NIT3065UC

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| | | | |
|-----------------------|--------------|---------------------------|----------|
| Cooktop Size (Inches) | 30.0 | Electric Supply (Volts) | 240.0 |
| Dual/Triple Element | No | Element #1 Size in Inches | 6 |
| Simmer Element | Yes | Element #1 Type | Standard |
| Control Location | Front center | Element #2 Size in Inches | 9 |
| | | Element #2 Type | Standard |



30"



30"

500 Series

– NIT5065UC Black w/Stainless Steel Trim



– Sleek Touch Control Panel Offers a Choice of 17 Settings for Unprecedented Temperature Control with PreciseSelect™
 – Front and Back Stainless Steel Strip for a Premium Look

– Countdown™ Timer–Built-in Timers for Each Element. Doubles as General-Purpose Kitchen Timer
 – Clean Lock–Prevents Unwanted Changing of Settings while Cleaning Spill-overs
 – PreciseSelect™–Direct Cooking Level Selection (17 Settings)

– 11" Heating Element with Powerful 3,600 Watts
 – SpeedBoost®–This Fast-heat Mode Boils Water Twice as Fast as Conventional Electric Cooktops

– Overflow Detection–Sounds Alarm and Shuts off Cooktop in Case of an Overflow
 – ChildLock–Prevents the Cooktop from Being Accidentally Switched On, Locks Temperature Settings if in Use
 – Safe Start–Ensures that Element Only is Activated; Others Remain Off
 – Anti-Overheat System–Shuts Off Cooktop
 – Two-level Heat Indicator–Warns if Cooktop is Warm or Hot

– PotSense™–Automatically Adjusts Cooking Element to the Size of the Pan Bottom

– n/a

300 Series

– NIT3065UC Black



– Sleek Touch Control Panel Offers a Choice of 17 Settings for Unprecedented Temperature Control with PreciseSelect™

– Countdown™ Timer–Built-in Timers for Each Element. Doubles as General-Purpose Kitchen Timer

– 11" Heating Element with Powerful 3,600 Watts
 – SpeedBoost®–This Fast-heat Mode Boils Water Twice as Fast as Conventional Electric Cooktops

– Overflow Detection–Sounds Alarm and Shuts off Cooktop in Case of an Overflow
 – ChildLock–Prevents the Cooktop from Being Accidentally Switched On, Locks Temperature Settings if in Use
 – Safe Start–Ensures that Element Only is Activated; Others Remain Off
 – Anti-Overheat System–Shuts Off Cooktop
 – Two-level Heat Indicator–Warns if Cooktop is Warm or Hot

– PotSense™–Automatically Adjusts Cooking Element to the Size of the Pan Bottom

– n/a

Induction Cooktop Technical Details

| Model | 800 Series, 36" | 800 Series, 30" | 500 Series, 36" | 500 Series, 30" | 300 Series, 30" |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Color | | | | | |
| Black w/ Stainless Steel Trim | NIT8665UC | NIT8065UC | NIT5665UC | NIT5065UC | |
| Black | | | | | NIT3065UC |
| Element Size and Performance | | | | | |
| Left Front Size(s) | 7" | 9" | 7" | 9" | 9" |
| Left Front Performance (with SpeedBoost®) | 1,800 (2,500) W | 2,200 (3,300) W | 1,800 (2,500) W | 2,200 (3,300) W | 2,200 (3,300) W |
| Left Rear Size(s) | 7" | 6" | 7" | 6" | 6" |
| Left Rear Performance (with SpeedBoost®) | 1,800 (2,500) W | 1,400 (1,800) W | 1,800 (2,500) W | 1,400 (1,800) W | 1,400 (1,800) W |
| Center Size(s) | 11" / 7" | | 11" / 7" | | |
| Center Performance (with SpeedBoost®) | 2,800 (4,400) W / 1,800 (2,500) W | | 2,800 (4,400) W / 1,800 (2,500) W | | |
| Right Rear Size(s) | 6" | 11" | 6" | 11" | 11" |
| Right Rear Performance (with SpeedBoost®) | 1,400 (1,800) W | 2,400 (3,600) W | 1,400 (1,800) W | 2,400 (3,600) W | 2,400 (3,600) W |
| Right Front Size(s) | 9" | 6" | 9" | 6" | 6" |
| Right Front Performance (with SpeedBoost®) | 2,200 (3,300) W | 1,400 (1,800) W | 2,200 (3,300) W | 1,400 (1,800) W | 1,400 (1,800) W |
| Cooktop Power Requirements | | | | | |
| Voltage | Dual Rated 208/240 V, 3-Wire, 60 Hz | Dual Rated 208/240 V, 3-Wire, 60 Hz | Dual Rated 208/240 V, 3-Wire, 60 Hz | Dual Rated 208/240 V, 3-Wire, 60 Hz | Dual Rated 208/240 V, 3-Wire, 60 Hz |
| Amperage / Breaker | 50 | 40 | 50 | 40 | 40 |

Gas Cooktop Technical Details

| Model | 800 Series, 36" | 800 Series, 30" | 500 Series, 36" | 500 Series, 30" | 300 Series, 36" | 300 Series, 36" |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Color | | | | | | |
| Stainless Steel | NGM8654UC | NGM8054UC | NGM5654UC | NGM5054UC | NGM3654UC | NGM3054UC |
| Black | | | NGM5664UC | NGM5064UC | | |
| White | | | NGM5624UC | NGM5024UC | | |
| Burner Performance | | | | | | |
| Left Front Performance | 1,350–12,000 BTU | 1,350–10,000 BTU | 1,350–12,000 BTU | 1,350–10,000 BTU | 1,350–12,000 BTU | 1,350–10,000 BTU |
| Left Rear Performance | 1,350–12,000 BTU | 400–5,500 BTU | 1,350–12,000 BTU | 1,350–10,000 BTU | 1,350–12,000 BTU | 1,350–10,000 BTU |
| Center Performance | 800–18,000 BTU | 800–16,000 BTU | 1,350–16,000 BTU | n/a | 1,200–14,000 BTU | n/a |
| Right Front Performance | 1,350–12,000 BTU | 400–5,500 BTU | 1,350–12,000 BTU | 1,350–16,000 BTU | 1,350–12,000 BTU | 1,350–14,000 BTU |
| Right Rear Performance | 400–5,500 BTU | 1,350–10,000 BTU | 400–5,500 BTU | 400–5,500 BTU | 550–5,500 BTU | 550–5,500 BTU |
| Cooktop Installation Requirements | | | | | | |
| Voltage | 120 V, 3 Wire Power Cord | 120 V, 3 Wire Power Cord | 120 V, 3 Wire Power Cord | 120 V, 3 Wire Power Cord | 120 V, 3 Wire Power Cord | 120 V, 3 Wire Power Cord |
| Amperage / Breaker | 15 | 15 | 15 | 15 | 15 | 15 |

BOSCH 30" WALL MOUNT CHIMNEY HOOD**[RELATED SECTION 11 31 13]**

Model Number: DKE9605PUC

Location: Living Module

Dimensions:

Width: 30"

Height: 28-1/8" – 43-5/16" / 31-3/4" – 46 13/16"

Depth: 20-7/16"

Weight: 50 lbs

Finish: Brushed Stainless Steel, Glass

Features:

Plug type: 120V-3 prong

Operating Mode: Convertible: Ducted / Recirculating

Motor location: Installed in flue

Power cord length [in]: 51 2/16 "

Maximum CFM: 600 cu ft mi

Diameter of air duct top: 6"

Number of lights: 2

Total power of the lamps [W]: 40 W

Required distance above cooktop/ranges: 30"/30"

Electrical:

Watts: 580 W

Volts: 110 V

Frequency: 60 Hz

Approval Certificates:

ETL

Available: Lowes

Price: \$1,259.10





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Home : [Search "bosch 30 inch range hood"](#) : [Bosch 30-Inch Ducted Range Hood](#)
(Color: Stainless Steel)



Bosch 30-Inch Ducted Range Hood (Color: Stainless Steel)

Item #: 195305 | Model #:DKE9605PUC

★★★★★ Be the first to [write a review!](#)

\$1,259.10

Was: \$1,399.00 (Save 10% thru 08/08/2011)

[Rebate Available](#)



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Bosch 30-Inch Ducted Range Hood
(Color:...

Not Yet Rated

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Was: \$1,199.00
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Bosch 30-Inch Ducted Range Hood
(Color:...

Not Yet Rated

\$854.10

Was: \$949.00
(Save 10% through 08/08/2011)



Whirlpool 30-Inch Ducted Range Hood
(Color:...

Not Yet Rated

\$404.10

Was: \$449.00
(Save 10% through 08/08/2011)

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| | | | |
|---------------------------|-----------------|---------------------------|-----|
| Manufacturer Color/Finish | Stainless Steel | CSA Safety Listing | Yes |
| Height (Inches) | 28.125 | Sones Rating (Horizontal) | 0 |
| | | ETL Safety Listing | Yes |



Glass Canopy



Canopy



Pyramid-style Canopy

| 800 Series | 500 Series | 300 Series |
|---|---|--|
| <ul style="list-style-type: none"> - DKE9665PUC 36" Stainless Steel - DKE9605PUC 30" Stainless Steel | <ul style="list-style-type: none"> - DKE9465MUC 36" Stainless Steel - DKE9405MUC 30" Stainless Steel | <ul style="list-style-type: none"> - DKE9365AUC 36" Stainless Steel - DKE9305AUC 30" Stainless Steel |
| | | |
| <ul style="list-style-type: none"> - Sophisticated Glass Canopy - Wall or Ceiling Mounted Chimney Hood - Brushed Stainless Steel Finish | <ul style="list-style-type: none"> - Brushed Stainless Steel Finish | <ul style="list-style-type: none"> - Pyramid-style Canopy - Wall Mounted Chimney Hood - Brushed Stainless Steel Finish |
| <ul style="list-style-type: none"> - Dishwasher-safe Mesh Filters - Seven-segment Digital Display - Recirculation Option Available - Two Halogen Lights - Adjustable Chimney | <ul style="list-style-type: none"> - Dishwasher-safe Mesh Filters - Seven-segment Digital Display - Recirculation Option Available - Two Halogen Lights - Adjustable Chimney | <ul style="list-style-type: none"> - Dishwasher-safe Mesh Filters - Slide-Switch Control - Two Incandescent Lights - Adjustable Chimney |
| <ul style="list-style-type: none"> - 600 CFM Blower Included - Whisper-quiet at 54 dBA - Quickly and Quietly Clears the Air of Smoke and Odor - Four Power Levels | <ul style="list-style-type: none"> - 600 CFM Blower Included - Whisper-quiet at 53 dBA - Quickly and Quietly Clears the Air of Smoke and Odor - Four Power Levels | <ul style="list-style-type: none"> - 400 CFM Blower Included - Whisper-quiet at 58 dBA - Quickly and Quietly Clears the Air of Smoke and Odor - Three Power Levels |
| <ul style="list-style-type: none"> - DHZ9600UC 11-ft. Chimney Extension - DRZ94UC Recirculation Kit | <ul style="list-style-type: none"> - DHZ9400UC 11-ft. Chimney Extension - DRZ94UC Recirculation Kit | <ul style="list-style-type: none"> - DHZ9300UC 11-ft. Chimney Extension |

Ventilation



BOSCH 30" SINGLE WALL OVEN**[RELATED SECTION 11 31 13]**

Model Number: HBL3350UC

Location: Living Module

Dimensions:

Width: 29-3/4"

Height: 29-1/16"

Depth: 23-7/8"

Weight: 167 lbs

Finish: Stainless Steel

Features:

Cooking method first cavity: Bake, Broil, Top heating, 1/3 bottom heat, Warm

Cleaning system - cavity 1: Self Clean

Included accessories: 2 x Oven racks /upper

Cavity type: Shelf support rails

Plug type: Fixed connection, No plug

Power cord length [in]: 50"

Electrical:

Wattage: 5,800 W

Voltage: 240/208 V

Current: 30 A; 25 A

Frequency: 60 Hz

Approval Certificates:

CSA

Available: Lowes

Price: \$1,304.10





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Home : Search "hbl3350uc" : Bosch 30-Inch Single Electric Wall Oven (Color: Stainless Steel)



Bosch 30-Inch Single Electric Wall Oven (Color: Stainless Steel)

Item #: 11996 | Model #: HBL3350UC

★★★★★ Be the first to write a review!

\$1,304.10

Was: \$1,449.00 (Save 10% thru 08/08/2011)

[Rebate Available](#)



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★★★★★
\$1,799.10

Was: \$1,999.00
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Bosch 30-Inch Single Electric Wall Oven...

Not Yet Rated

\$1,484.10

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(Save 10% through 08/08/2011)



KitchenAid 30-Inch Single Electric Wall Oven...

★★★★★
\$1,439.10

Was: \$1,599.00
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Whirlpool 30-Inch Single Electric Wall Oven...

Not Yet Rated

\$899.10

Was: \$1,199.00
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Bosch 27-Inch Single Electric Wall Oven...

★★★★★
\$1,799.10

Was: \$1,999.00
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Appliance Color/Finish

Stainless Steel

Adjustable Cleaning Levels

Yes

Delay Bake

Yes

Delay Clean

No

Light Self-Clean Option

Yes



Single

Colors



Stainless Steel
(HBL5750UC Model Shown)



Black
(HBL5760UC Model Shown)



White
(HBL5720UC Model Shown)

Ovens | Microwaves |
Warming Drawers

300 Series

- HBL3350UC 30" Stainless Steel
- HBL3360UC 30" Black



- Contemporary Stainless Steel Design
- ClearTouch® Glass Control
- Dial Controls - Direct Access to Cooking Modes
- Flush-to-Cabinet Design

- #1 in Capacity at 4.7 cu. ft.
- Recessed Broil Element for Increased Capacity and Safety
- Hidden Bake Element for Increased Capacity

- Amber-Colored Display
- Timer with Cook Time Function
- Preheat Monitor Shows Progress of Preheat Cycle
- Extra-Large Door Window for Easy Monitoring of Cooking
- High-Quality, Self-cleaning Rack Supports

- Thermal Cooking with Bake, Broil and Roast

- EcoClean® Two-hour Self-Clean Cycle

- HEZ1070 30" Ball Bearing Telescopic Rack



BOSCH ASCENTA INTEGRA DISHWASHER**[RELATED SECTION 11 31 13]**

Model Number: SHX4AP05UC

Location: Living Module

Dimensions:

Width: 23-1/2"

Height: 33-7/8"

Depth: 24"

Weight: 99 lbs

Finish: Stainless Steel

Features:

Installation: Built-under

Capacity: 14 place settings.

4 wash cycles, 2 options

Quick Wash: 30 Minutes or less

Half Load Option of Small Loads

Flow-Through Water Heater

Triple Filtration System

Electrical:

Wattage: 1400 W

Current: 12 A

Voltage: 120 V

Frequency: 60 Hz

Efficiency:

279 kwh/yr

EcoSense Reduces Energy Usage up to 20%

Approval Certificates:

NSF- Eliminates 99.9% of Bacteria

Energy Star Qualified

Available: Lowes

Price: \$629.10





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Bosch 23.5625-Inch Built-In Dishwasher (Color: Stainless Steel) ENERGY STAR

Item #: 153338 | Model #:SHE55M15UC

★★★★★ [11 reviews](#) | [Write a review](#)

\$854.10

Was: \$949.00 (Save 10% thru 08/08/2011)



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Customers Also Viewed



Whirlpool
23.875-Inch Built-In Dishwasher...

★★★★★

\$539.10

Was: \$599.00

(Save 10% through 08/08/2011)



Bosch 23-9/16-Inch Built-In Dishwasher...

★★★★★

\$764.10

Was: \$849.00

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Lowe's Exclusive

No

CEE Tier Qualified

CEE Tier II

Fold-Down Tines

Upper and lower racks

Rinse and Hold Cycle

No

Removable Silverware Basket

Yes

Unique or Exclusive Cycle

EcoAction Option

Silverware Basket Covers

Yes

Number of Cycles

5.0

Stemware Holder

Yes

Number of Wash Levels

5.0



DLX

| Ascenta® Series | Ascenta® Series | Ascenta® Series |
|---|---|---|
| <ul style="list-style-type: none"> – SHX6AP05UC Stainless Steel – SHX6AP06UC Black – SHX6AP02UC White | <ul style="list-style-type: none"> – SHX5AL05UC Stainless Steel – SHX5AL06UC Black – SHX5AL02UC White | <ul style="list-style-type: none"> – SHX4AP05UC Stainless Steel – SHX4AP06UC Black – SHX4AP02UC White |
| | | |
| <ul style="list-style-type: none"> – Stainless Steel TallTub w/ PP* – Six Wash Cycles and Two Options | <ul style="list-style-type: none"> – Stainless Steel TallTub w/ PP* – Five Wash Cycles and Two Options | <ul style="list-style-type: none"> – Stainless Steel TallTub w/ PP* – Four Wash Cycles and Two Options |
| <ul style="list-style-type: none"> – Virtually Silent: 50 dBA | <ul style="list-style-type: none"> – Virtually Silent: 53 dBA | <ul style="list-style-type: none"> – Virtually Silent: 53 dBA |
| <ul style="list-style-type: none"> – 300 kWh/yr–ENERGY STAR® Qualified – Uses only 2.38 gallons of water per load – Exceeds ENERGY STAR Requirements by 9% for Energy and 144% for Water – EcoSense® Reduces Energy Usage up to 20% – Half-load Option for Small Loads | <ul style="list-style-type: none"> – 300 kWh/yr–ENERGY STAR® Qualified – Uses only 2.38 gallons of water per load – Exceeds ENERGY STAR Requirements by 9% for Energy and 144% for Water – EcoSense® Reduces Energy Usage up to 20% – Half-load Option for Small Loads | <ul style="list-style-type: none"> – 300 kWh/yr–ENERGY STAR® Qualified – Uses only 2.38 gallons of water per load – Exceeds ENERGY STAR Requirements by 9% for Energy and 144% for Water – EcoSense® Reduces Energy Usage up to 20% – Half-load Option for Small Loads |
| <ul style="list-style-type: none"> – Bosch Exclusive 24/7 Overflow Leak Protection – NSF-certified–Eliminates 99.9% of Bacteria | <ul style="list-style-type: none"> – Bosch Exclusive 24/7 Overflow Leak Protection – NSF-certified–Eliminates 99.9% of Bacteria | <ul style="list-style-type: none"> – Bosch Exclusive 24/7 Overflow Leak Protection – NSF-certified–Eliminates 99.9% of Bacteria |
| <ul style="list-style-type: none"> – 14 Place Setting Capacity – 300 Series Racks with Flexible Silverware Basket – Manual Height Adjustment Upper Rack | <ul style="list-style-type: none"> – 14 Place Setting Capacity – Standard Racks with Standard Silverware Basket | <ul style="list-style-type: none"> – 14 Place Setting Capacity – Standard Racks with Standard Silverware Basket |
| <ul style="list-style-type: none"> – Three-, Six-, Nine-hour Delay Start Timer – Quick Wash–In 30 Minutes or Less | <ul style="list-style-type: none"> – Three-, Six-, Nine-hour Delay Start Timer – Quick Wash–In 30 Minutes or Less | <ul style="list-style-type: none"> – Three-, Six-, Nine-hour Delay Start Timer – Quick Wash–In 30 Minutes or Less |
| <ul style="list-style-type: none"> – n/a | <ul style="list-style-type: none"> – n/a | <ul style="list-style-type: none"> – n/a |
| <ul style="list-style-type: none"> – SGZ1010UC Polypropylene Supply and Drainage Hose Extension – SGZ1052UC Four-part Accessory Kit – SGZPC001UC Power Cord w/Connectors – SMZ5002UC Anti-Tarnish Silverware Cassette | <ul style="list-style-type: none"> – SGZ1010UC Polypropylene Supply and Drainage Hose Extension – SGZ1052UC Four-part Accessory Kit – SGZPC001UC Power Cord w/Connectors – SMZ5002UC Anti-Tarnish Silverware Cassette | <ul style="list-style-type: none"> – SGZ1010UC Polypropylene Supply and Drainage Hose Extension – SGZ1052UC Four-part Accessory Kit – SGZPC001UC Power Cord w/Connectors – SMZ5002UC Anti-Tarnish Silverware Cassette |

*Polypropylene

Colors



Stainless Steel
(SHX65P05UC
Model Shown)



Black
(SHX65P06UC
Model Shown)



White
(SHX4AP02UC
Model Shown)



Titanium
(SHX45P01UC
Model Shown)



Fully Integrated
(SHV65P03UC
Model Shown)



BOSCH CLOTHES STACKABLE WASHER**[RELATED SECTION 11 31 23]**

Model Number: WAS24460UC

Location: Laundry Closet

Dimensions:

Width: 23-1/2"

Height: 33"

Depth: 23-1/2"

Weight: 168 lbs

Finish: White, Stainless Steel Tub

Features:

Capacity: 3.4 cu ft

Start delay time max: 24 Hrs.

Maximum spin speed: 1,200 rpm

Status indicator: LED-display

Electrical:

Wattage: 2,300 W

Current: 12 A

Voltage: 208-240 V

Frequency: 60 Hz

Efficiency:

Energy consumption: 130 kWh/yr

Water Consumption: 3904 gal/yr

Approval Certificates:

CE

UL Safety Approval

VDE

Available: Lowes

Price: \$1,169.10





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Bosch 2.16 Cu. Ft. Stackable Front-Load Washer (White) ENERGY STAR

Item #: 36602 | Model #: WAS24460UC

★★★★★ 10 reviews | [Write a review](#)

\$1,169.10

Was: \$1,299.00 (Save 10% thru 08/08/2011)

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Bosch 2.16 Cu. Ft. Stackable Front-Load...

★★★★★
\$989.10



Bosch 3.9 Cu. Feet Stackable Electric Dryer...

Not Yet Rated
\$699.10



Whirlpool 2 Cu. Ft. Stackable Front-Load...

★★★★★
\$674.10



Samsung 3.5 Cu. Ft. Stackable Front-Load...

★★★★★
\$539.10

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| | | | |
|--------------------------|-----|----------------------------------|-----|
| Lowe's Exclusive | No | Sound Reduction | Yes |
| Silk Cycle | Yes | Add a Garment | Yes |
| Wool Cycle | Yes | Cycle Status Lights | Yes |
| Handwashable Cycle | Yes | Estimated Time Remaining Display | Yes |
| Quick/Express Wash Cycle | Yes | High Efficiency | Yes |
| Bulky/Large Items Cycle | No | Wash Now, Dry Later Option | No |

Compact Washer Specifications



| Model Numbers | – WAS24460UC White | – WAS20160UC White | – WFL2090UC White |
|--------------------|---|--|---|
| | | | |
| Appearance | <ul style="list-style-type: none"> – 3.4 cu. ft. Drum Capacity* – 15 Wash Cycles and Seven Options – Stainless Steel Structured Drum | <ul style="list-style-type: none"> – 3.4 cu. ft. Drum Capacity* – 15 Wash Cycles and Five Options – Stainless Steel Structured Drum | <ul style="list-style-type: none"> – 2.1 cu. ft. Drum Capacity* – 15 Wash Cycles and Four Options – Stainless Steel Drum |
| Efficiency | <ul style="list-style-type: none"> – Exceeds ENERGY STAR® 2011 Guidelines– Uses only 130 kWh/yr – Bosch Washers Exceed Federal Energy Standards by up to 76% – Up to 1,200 RPM Maximum Spin Speed – Advanced SensoTronic® II Plus Analyzes Washer for Appropriate Level and Temperature of Water – Internal Water Heater Heats Water Quickly and Efficiently | <ul style="list-style-type: none"> – Exceeds ENERGY STAR® 2011 Guidelines– Uses only 125 kWh/yr – Bosch Washers Exceed Federal Energy Standards by up to 70% – Up to 1,000 RPM Maximum Spin Speed – Advanced SensoTronic® II Plus Analyzes Washer for Appropriate Level and Temperature of Water – Internal Water Heater Heats Water Quickly and Efficiently | <ul style="list-style-type: none"> – Exceeds ENERGY STAR® 2011 Guidelines– Uses only 121 kWh/yr – Bosch Washers Exceed Federal Energy Standards by up to 61% – Up to 1,000 RPM Maximum Spin Speed – Advanced SensoTronic® II Plus Analyzes Washer for Appropriate Level and Temperature of Water – Internal Water Heater Heats Water Quickly and Efficiently |
| Quietness | <ul style="list-style-type: none"> – Virtually Silent: 56 dBA – AntiVibration Design Reduces Vibration by up to 30% | <ul style="list-style-type: none"> – Virtually Silent: 56 dBA – AntiVibration Design Reduces Vibration by up to 30% | <ul style="list-style-type: none"> – Virtually Silent: 56 dBA |
| Gentle Care | <ul style="list-style-type: none"> – Unique Raindrop Drum Pattern that Resists Snags for Powerful Cleaning – Sanitary Cycle Heats Wash Water Up to 161° F to Kill Bacteria – KidsCare® Cycle Heats the Wash Water Up to 140° F to Remove Toughest Stains – Refresh Cycle Refreshes Loads Up to 4 lbs – Sport Wear Cycle – Dark Color Cycle Prevents Fading – Silk/Satin Cycle for Sensitive Fabrics – Wool/Handwash Cycle – Quick Wash Cycle for Small Light Soil Loads – Heavy Duty Option Targets the Toughest Stains with Just a Touch of a Button – Reduced Ironing Option Extended Fluffing – Rinse Plus Option Improves Rinsing | <ul style="list-style-type: none"> – Unique Raindrop Drum Pattern that Resists Snags for Powerful Cleaning – Sanitary Cycle Heats Wash Water Up to 161° F to Kill Bacteria – KidsCare® Cycle Heats the Wash Water Up to 140° F to Remove Toughest Stains – Refresh Cycle Refreshes Loads Up to 4 lbs – Wool/Handwash Cycle – Heavy Duty Option Targets the Toughest Stains with Just a Touch of a Button – Reduced Ironing Option Extended Fluffing – Rinse Plus Option Improves Rinsing | <ul style="list-style-type: none"> – High Quality, Snag Free Stainless Steel Drum – Power Temp. Boost Cycle Heats Wash Water Up to 161° F to Kill Bacteria – Temp. Boost Cycle Heats the Wash Water Up to 140° F to Remove Toughest Stains – Refresh Cycle Refreshes Up to 4 lbs of Lightly Soiled Laundry – Wool/Handwash Cycle – Rinse Plus Option Improves Rinsing |
| Convenience | <ul style="list-style-type: none"> – LED Display–Easy to Read – Stackable–Space Saving/Easy Installation – Touch Control Technology–Easily Activate Each Cycle With Just The Touch of a Button – Pull-out Tray** for Use as a Laundry Shelf or Folding Table – Washer Plugs into Dryer | <ul style="list-style-type: none"> – Stackable–Space Saving/Easy Installation – Touch Control Technology–Easily Activate Each Cycle With Just The Touch of a Button – Pull-out Tray** for Use as a Laundry Shelf or Folding Table – Washer Plugs into Dryer | <ul style="list-style-type: none"> – Stackable–Space Saving/Easy Installation |
| Accessories | <ul style="list-style-type: none"> – WMZ20460 12" White Pedestal – WTZ11300UC White Stacking Kit w/ Pull-out Tray – WTZ11310UC Stacking Kit – WTZ1640 AquaStop® Hose–Washer | <ul style="list-style-type: none"> – WMZ20460 12" White Pedestal – WTZ11300UC White Stacking Kit w/ Pull-out Tray – WTZ11310UC Stacking Kit – WTZ1640 AquaStop® Hose–Washer | <ul style="list-style-type: none"> – WTZ11300UC White Stacking Kit w/ Pull-out Tray – WTZ11310UC Stacking Kit – WTZ1640 AquaStop® Hose–Washer |

* Capacity is based on IEC method of measurement. **Accessories Purchased Separately.

BOSCH CLOTHES STACKABLE DRYER**[RELATED SECTION 11 31 23]**

Model Number: WTE86300US

Location: Laundry Closet

Dimension:

Width: 23-1/2"

Height: 33-3/16"

Depth: 24-5/8"

Weight: 99 lbs

Finish: White

Features:

Capacity: 3.9 cu ft.

Dryer type: Condensing

Door hinge: Right-hand

Plug type: 240V-4 prong

Power cord length [in]: 57"

Capacity cotton [Kg]: 7 kg

Moisture monitoring system: Automatic thermal electric damp detect

Electrical:

Wattage: 2,800 W

Current: 13 A

Voltage: 240/208 V

Frequency: 60 Hz

Approval Certificates:

CE

CSA

UL Safety Approval

Available: Lowes

Price: \$989.10





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Home : Search "wte86300us" : Bosch 3.9 Cu. Feet Stackable Electric Dryer (White)



Bosch 3.9 Cu. Feet Stackable Electric Dryer (White)

Item #: 165667 | Model #:WTE86300US

★★★★★ [1 review](#) | [Write a review](#)

\$989.10

Was: \$1,099.00 (Save 10% thru 08/08/2011)



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Minimum Purchase Required [Get Details](#)

Customers Also Viewed



Bosch 2.16 Cu. Ft. Stackable Front-Load...

★★★★★
\$1,169.10

Was: \$1,299.00
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Bosch 3.9 Cu. Feet Stackable Electric Dryer...

★★★★★
\$719.10

Was: \$799.00
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Bosch 2.16 Cu. Ft. Stackable Front-Load...

★★★★★
\$989.10

Was: \$1,099.00
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Whirlpool 3.8 Cu. Feet Electric Dryer (White)

★★★★★
\$674.10






Was: \$749.00
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[Description](#) | [Specifications](#) | [Info & Guides](#) | [Protection Plans](#) | [Reviews](#) | [Q&A](#)

| | | | |
|------------------------|-----|---------------------------|------------|
| Lowe's Exclusive | No | Check Lint Screen Light | Yes |
| Quick/Express Cycle | No | Self-Cleaning Lint Filter | Yes |
| Wrinkle Free Cycle | Yes | Window in Door | Yes |
| Energy Efficient Cycle | Yes | Door Type | Side swing |

Compact Dryer Specifications



| | Model WTE86300US White (Condensation) | Model WTV76100US White (Vented) |
|----------------------|---|---|
| Model Numbers | – WTE86300US White (Condensation) | – WTV76100US White (Vented) |
| |    |   |
| Appearance | <ul style="list-style-type: none"> – 3.9 cu. ft. Drum Capacity* – 11 Drying Cycles and Three Drying Options – Stainless Steel Structured Drum – See-thru Door | <ul style="list-style-type: none"> – 3.9 cu. ft. Drum Capacity* – Nine Drying Cycles and One Drying Option – Stainless Steel Structured Drum – See-thru Door |
| Efficiency | – Electronic Moisture Sensor Monitors the Drying Process to Prevent Wasting Energy and Overdrying | – Electronic Moisture Sensor Monitors the Drying Process to Prevent Wasting Energy and Overdrying |
| Quietness | – Virtually Silent: 67 dBA | – Virtually Silent: 67 dBA |
| Gentle Care | <ul style="list-style-type: none"> – High Quality, One Piece Snag Free Stainless Steel Drum – Unique Structured Drum Pattern Creates an Air Cushion to Protect Your Clothes – 118 CFM Gently Dries Clothes Using Moderate Heat and High Air Volume – Heat Sensors and Intelligent Controls Prevent Overheating – Touch Up Cycle Reduces Drying Time for Lighter Loads – Wool Cycle to Gently Dry Delicates – Delicates/Low Heat Option Reduces Heat on Specified Program – Easy Ironing Option Prepares Clothes to be Ironed – Extended WrinkleBlock® Up to 120 Min. Tumbling Reduces Wrinkles | <ul style="list-style-type: none"> – High Quality, One Piece Snag Free Stainless Steel Drum – Unique Structured Drum Pattern Creates an Air Cushion to Protect Your Clothes – 110 CFM Gently Dries Clothes Using Moderate Heat and High Air Volume – Heat Sensors and Intelligent Controls Prevent Overheating – Touch Up Cycle Reduces Drying Time for Lighter Loads – Delicates/Low Heat Option Reduces Heat on Specified Program – Extended WrinkleBlock® Up to 60 Min. Tumbling Reduces Wrinkles |
| Convenience | <ul style="list-style-type: none"> – Condensation Dryer—Requiring No Ducting and No Blower—Easy and Cost-Effective Installation – LED Display—Easy to Read – Stackable—Space Saving/Easy Installation – Touch Control Technology Easily Activate Each Cycle With Just The Touch of a Button – Pull-out Tray** for Use as a Laundry Shelf or Folding Table | <ul style="list-style-type: none"> – Stackable—Space Saving/Easy Installation – Touch Control Technology Easily Activate Each Cycle With Just The Touch of a Button – Pull-out Tray** for Use as a Laundry Shelf or Folding Table |
| Accessories | <ul style="list-style-type: none"> – WMZ20460 12" White Pedestal – WTZ11300UC White Stacking Kit w/ Pull-out Tray – WTZ11310UC Stacking Kit | <ul style="list-style-type: none"> – WMZ20460 12" White Pedestal – WTZ11300UC White Stacking Kit w/ Pull-out Tray – WTZ11310UC Stacking Kit |

Accessories



Stacking Kit with Pull-out Tray
(WTZ11300UC Model Shown)



Stacking Kit
(WTZ11310UC Model Shown)



12" White Pedestal
(WMZ20460 Model Shown)



AquaStop® Hose-Washer
(WTZ1640 Model Shown)



BOSCH STACKING KIT

[RELATED SECTION 11 31 23]

Model Number: WTZ1600

Location: Laundry Closet

Finish: white

Features:

- Allows dryer to be stacked on washer

- Pulls out to become shelf

Available: Lowes




WTZ1600

connection set with pull out tray Accessories Laundry Care

- ▶ Overview
- ▶ Technical specs
- ▶ Additional documents



 Click to enlarge



| General Properties |
|--|
| Product group: Washing machine |
| Brand: Bosch |
| Product name / series name: product line supplement washing machines |
| SKU: WTZ1600 |
| EAN code: 4242002534640 |
| Dimensions of the packed product (HxWxD): 240 x 750 x 780 cm |
| Net weight (kg): 7.56 kg |
| Gross weight (kg): 8.10 kg |
| Quantity per packing unit: 0 |
| Standard number of units per pallet: 0 |
| EAN Barcode: !2E20AC-fdegeal |
| UPC code: 825,225,880,271 |
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MITSUBISHI DLP PROJECTOR**[RELATED SECTION 11 52 00]**

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of The Solar Homestead.



Model Number: HC4000

Location: Living Module

Dimension:

Width: 13-1/2"

Height: 5"

Depth: 10-1/2"

Weight: 7.7 lbs

Finish: Black

Features:

Projection Method: Front, ceiling, rear

Economy Mode of Lamp Life: 5000 Hour

Standard Mode Brightness: 1300 lumens

Maximum Resolution: 1920 x 1200

Diagonal Image Size: 300"

Native Aspect Ratio: 16:9

Contrast Ratio: 4000:1

Vertical Keystone Correction: -15degrees /+ 15 degrees

Video Signal Format: NTSC, Pal, SECAM

Video Signal Standard: HDTV

Scan Format: 1080p

Number of HDMI: 2

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Projector-Gear Projector Ceiling Mount for MITSUBISHI HC4000

Buy new: ~~\$60.00~~ \$24.95
1 Used & new from \$24.95
★★★★★ (2)



Epson PowerLite Home

Buy new: Add to cart to see price
29 Used & new from \$1,099.00
★★★★★ (88) Prime

Customers also searched for: [epson 8350](#), [mitsubishi hc4000](#), [hd20](#)

Mitsubishi HC4000 300-Inches 1080p Front Projector - Black

by Mitsubishi

★★★★★ (5 customer reviews) | Like (1)



List Price: ~~\$1,999.00~~

Price: **\$1,159.99** & this item ships for **FREE with Super Saver Shipping.** [Details](#)
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In Stock.

Ships from and sold by Amazon.com. Gift-wrap available.

Only 20 left in stock--order soon (more on the way).

Want it delivered Tuesday, August 9? Order it in the next 39 hours and 19 minutes, and choose

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Is this a gift? Please note that this item ships in its own packaging and cannot be gift-wrapped or wrapped.

Special Shipping Information: This item can be shipped only within the contiguous United States.

Features & Specifications

Native 1080p

High definition 1080p resolution for amazing picture quality

HDMI connectivity

Includes HDMI v1.3 input. Allows for a true digital connection for easy connections to your HD equipment

Anamorphic Mode Support

Includes Anamorphic Mode 1 and Mode 2 support for your viewing enjoyment and convenience

Color Management

Our new color management feature allows users to adjust images to their color preferences. Red, green, blue, cyan, magenta and yellow can each be adjusted individually with out affecting the color quality of other colors

Diamond Lens

The 4-cluster, 13-piece all-glass lens provides excellent focusing performance with 1.5x magnification of high-definition images

Ultra-Quiet Noise Level

Amazing low 25dBA noise level (low mode), so you can sit back and enjoy your home theater picture instead of any distracting equipment noise level

RS232 support

Convenient compatibility with 3rd party control devices

Top Access Lamp

Users can replace lamp with out taking down the projector if ceiling mounted. This design simplifies lamp replacements without turning the projector around or over when mounted on the ceiling or resting on a shelf

Long Lamp Life

An amazing lamp life estimated to last up to 5000hrs. Provides owner with hours of home cinema watching enjoyment.



Display

Imaging Technology:
DLP 0.65"

Brightness/Lumens:
1300 ANSI Lumens

Native Resolution:
1920 x 1080

Maximum Resolution:
1920 x 1200

Viewable Size:
50"- 300"

Contrast Ratio:
4000:1 (On/Off)

Color Wheel:
6-Segment (R,G,B,W,Y,C)
(On/Off)

Included Accessories

- Lamp Replacement Attachment
- Lens Cap
- Remote Control (w/ 2 batteries)
- Safety Manual
- User Manual CD



Size, Weight, Power

Weight:
7.7 lbs.

Dimensions: (W x H x D)
13.6" x 5.1" x 10.6"

Power Consumption:
340W/3.4A

Power Requirements:
AC 100-240V, 50/60Hz

Decibels:
25dBA (Low Mode)
31dBA (Standard Mode)

Lens & Operation

Lens Throw Ratio:
1.38 - 2.06

Zoom & Focus Adjustment:
Manual Zoom & Focus

PC/MAC Compatibility:
Yes

Scanning Frequency:
[H] 15-80 khz, [V] 50-85 Hz
[Dot Clock] max.170 MHz

*Estimated Lamp Life Rating:
5000 hrs (Low Mode)
N/A (Standard Mode)

Usage Replacement Lamp:
VLT-HC3800LP

Interface

NTSC, PAL, SECAM:
NTSC / NTSC 4.43 / PAL (including PAL-M, N) / SECAM / PAL-60
Component Video: 480i/p(525i/p), 576i/p(625i/p), 720p(750p), 1080i (1125i 60Hz), 1080i(1125i 50Hz), 1080P(50Hz,60Hz,24Hz)

Computer & Video Input Support:
RGB: mini D-sub 15pin x 1
Video: RCA x 1 + S-VIDEO x 1
Component Video: RCA x 3
Digital: HDMI x 1

RS-232 Communication Support: Yes

12V Trigger: Yes

Computer Monitor Loop-Out: No

Audio Speaker: N/A

Audio Out: N/A

USB Mouse Support: N/A

Warranty & Service:

Non-home theater projectors: Warranty & Service: 3-Years Limited Parts and Labor Warranty, plus 3-years or 10,000 hours (whichever comes first) DMD parts warranty; Express Replacement Assistance (ERA) during the warranty period, and 1-year or 500 hours (whichever comes first) lamp warranty. Please see limited warranty statement for details. Home theater projectors: Warranty & Service: 2-Years Limited Parts and Labor Warranty, and 1-year or 500 hours (whichever comes first) lamp warranty. Please see limited warranty statement for details. Exception:

LG 37" LCD HDTV**[RELATED SECTION 11 52 00]**

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of The Solar Homestead.

Model Number: 37LK450

Location: Living Module

Dimension:

Width: 36"

Height: 22-1/2"

Depth: 3"

Weight: 24.5 lbs

Features:

Screen Size: 37"

Native Display Resolution: 1920 x 1080

Contrast Ratio: 100,000: 1

Dolby Digital Decoder

Surround System: Infinite Sound

Electrical:

Wattage: 150 W

Standby Wattage: <0.1

Voltage: 100-240 V

Approval Certificates:

Energy Star Compliant

Available: Best Buy

Price: \$539.99





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More Images Demo

LG - 37" Class / 1080p / 60Hz / LCD HDTV

Model: 37LK450 | SKU: 2138158

Customer Reviews: ★★★★★ 5.0 [Read reviews \(4\)](#)

Backordered: Usually leaves our warehouse within 1-2 weeks
[Estimate Arrival Time](#)

Store Pickup: [Check Stores](#)

Special Offers:

- ✓ On Sale
- ✓ \$199.99-\$274.99 Mount & Service: [See How](#)

Financing:

- ✓ 18 Month Financing
- ✓ 6 Month Financing

Sale: **\$539.99**

Reg. Price: \$599.99
You Save: \$60.00

ADD TO CART

Protect Your Product

2-Year Protection Plan
\$69.99

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\$99.99

Buy Back Program **HOW-TO** [Calculate Value](#)

4-Year Buy Back Plan
\$59.98

INCLUDE PLAN

ADD TO WISH LISTS

Printer Friendly

37LK450

37" Class 1080p LCD TV
(37.0" measured diagonal)



FEATURES

- Full HD 1080p Resolution
- ENERGY STAR® Qualified
- Picture Wizard II
- Intelligent Sensor
- Smart Energy Saving
- ISFccc® Ready



IS IT A TV? OR SOMETHING BETTER?

If you've been hearing about how amazing Blu-ray entertainment is, or how much better your favorite shows would look in HD, you've heard right. The thing is, you need 1080p Full HD to get the most out of both. With the LK450, you can.



This stunning picture is the reason you wanted HDTV in the first place. With almost double the pixel resolution, Full HD 1080p gives it superior picture quality over standard HDTV.



ENERGY STAR qualified TVs use about 30% less energy than standard units. Earning the ENERGY STAR means a product meets strict energy efficiency guidelines set by the US Environmental Protection Agency and the Department of Energy.



Get easy self-calibration with on-screen reference points for key picture quality elements such as black level, color, tint, sharpness and backlight levels. Take the guesswork out of picture adjustments with this simple-to-use feature.



37LK450

37" Class 1080p LCD TV



PANEL SPECIFICATIONS

| | |
|----------------------|---------------------------------------|
| Screen Size | 37" Class (37.0" measured diagonally) |
| Resolution | 1920 x 1080p |
| Frame Rate | 60Hz |
| Contrast Ratio (DCR) | 100,000:1 |

BROADCASTING SYSTEM

| | |
|---------|-------------------------------|
| Analog | NTSC |
| Digital | ATSC/NTSC/Clear QAM (1 Tuner) |

VIDEO

| | |
|---|---|
| XD Engine | • |
| Aspect Ratio Correction | 6 Modes (16:9/Just Scan/Original/4:3/Zoom/Cinema Zoom) |
| Color Temperature Control | 3 Modes (Warm/Medium/Cool) |
| Picture Mode | 8 Modes (Intelligent Sensor/Vivid/Standard/Cinema/Sport/Game/Inf Expert 1/Inf Expert 2) |
| Just Scan | HDMI 1080p/1080i/720p |
| 0% OverScan | Component 1080p/1080i/720p RF 1080i/720p |
| 24p Real Cinema (24p 5:5/2:2 Pull Down) | • (HDMI 1080 24p) |
| Expert Mode/ISFccc Ready | • |
| xvYCC | • |
| AV Mode (Picture & Sound) | • (Cinema/Game/Sport) |
| Picture Wizard II (Easy Self Calibration) | • |

AUDIO

| | |
|--------------------------------|---|
| Mono/Stereo/Dual (MTS/SAP) | • |
| Audio Output (Watts - THD 10%) | 10W + 10W |
| Speaker System | 1Way 2 Speakers |
| Dolby Digital Decoder | • |
| Surround System | Infinite Surround |
| Bass/Treble/Balance | • |
| Auto Volume Leveler | • |
| Sound Mode | 5 Modes (Standard/Music/Cinema/Game/Sports) |
| Clear Voice II | • |

SPECIAL FEATURES

| | |
|----------------------|---|
| Smart Energy Saving | • |
| Intelligent Sensor | • |
| 1080p Source Input | HDMI 60p/30p/24p Component 60p/30p/24p RGB 60p (WXGA) |
| AV Input Navigation | • |
| Input Labeling | • |
| Child Lock | • |
| Closed Caption | • |
| SIMPLINK™ (HDMI CEC) | • |

CONVENIENCE FEATURES

| | |
|------------------------------|-------------------------------|
| Language | English/Spanish/French/Korean |
| Auto Tuning/Programming | • |
| Channel Add/Delete | • |
| Favorite Channel Programming | • |
| Auto/Manual Clock | • |
| On/Off Timer | • |
| Sleep Timer | • |
| Auto Off (Sleep) | • |

AV INPUTS/OUTPUTS

| | |
|--|--------------------|
| RF In (Antenna/Cable) | 1 (Rear) |
| AV In | 2 (1 Side, 1 Rear) |
| Component Video In (Y, Pb, Pr) + Audio | 2 (Rear) |

AV INPUTS/OUTPUTS

| | |
|-----------------------------|--------------------|
| HDMI™/HDCP Input | 3 (2 Rear, 1 Side) |
| USB 2.0 | 1 (Side) |
| Digital Audio Out (Optical) | 1 (Rear) |
| RGB In (D-Sub 15 Pin) - PC | 1 (Rear) |
| PC Audio Input | 1 (Rear) |
| RS-232C (Control/Service) | 1 (Rear) |
| Headphone Out | 1 (Side) |

CABINET

| | |
|-----------------|-------------------|
| Swivel | 20°/20° |
| VESA Compatible | • (200mm x 200mm) |
| Remote Control | Standard |

POWER

| | |
|------------------------|----------------------|
| ENERGY STAR® Qualified | • |
| Voltage, Hz | 100V - 240V, 50/60Hz |
| Consumption (Max.) | 180W |
| Consumption (Average) | 150W |
| Standby Mode | <0.1W |

DIMENSIONS/WEIGHT

| | |
|-----------------------------|-----------------------|
| TV without Stand (WxHxD) | 35.9" x 22.5" x 3.0" |
| TV with Stand (WxHxD) | 35.9" x 25.2" x 10.4" |
| Shipping Dimensions (WxHxD) | 45.7" x 26.8" x 6.3" |
| TV without Stand Weight | 24.5 lbs |
| TV with Stand Weight | 28.2 lbs |
| Shipping Weight | 35.5 lbs |

WARRANTY/UPC

| | |
|------------------|----------------------|
| Limited Warranty | 1 Year Parts & Labor |
| UPC | 719192581364 |

LG Electronics U.S.A., Inc.

1000 Sylvan Avenue Englewood Cliffs, NJ 07632
Customer Service and Technical Support: (800) 243-0000

LG.com

Design, features and specifications are subject to change without notice. Non-metric weights and measurements are approximate.

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SAMSUNG SPEAKERS

[RELATED SECTION 11 52 00]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of The Solar Homestead.



Model Number: HW-C450

Location: Living Module

Dimension:

Width: 37-1/2"

Height: 3-1/2"

Depth: 1-3/4"

Weight: 28.7 lbs

Finish: Black Ash

Features:

2.1 Channels

Audio Processing: Dolby Digital, DTS

Speakers: 2 Way 3 Front

Active Wireless Subwoofer

Bar Speaker

Connectivity: 1 Audio Output

Electrical:

Wattage: 280 W

Approval Certificates:

Energy Star Qualified

Available: Amazon.com

Price: \$319.00

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Audio & Home Theater

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Samsung HW-C451 Soundbar with Wireless Sub (Brushed Aluminum)

by [Samsung](#)

★★★★☆ (15 customer reviews) | Like (7)

List Price: ~~\$349.99~~

Price: **\$319.00**

You Save: **\$30.99 (9%)**



In Stock.

Ships from and sold by [Beach Camera](#).

Only 9 left in stock--order soon.

[2 used](#) from \$144.88

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★★★★☆ (115)

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★★★★☆ (245)

\$4.97



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★★★★☆ (171)

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\$9.99

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2.1 Channel Audio Bar Home Theater System

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HW-C450 \$349.99 ★★★★★ 94 REVIEWS

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Features

ENERGY STAR® Compliant

This eco-friendly feature helps you save money, while helping to save the environment by consuming less energy. ENERGY STAR® is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy that promotes energy efficiency.



Enhanced experience with Virtual Surround Sound

Experience a rich, powerful sound that completely envelopes you. All it takes is a 2.1 channel audio system consisting of two front speakers and a subwoofer to allow you to enjoy amazing virtual surround sound.



Wall mountable to maximize space

Are you a fan of minimalist design or want to free up space? Maximize your room's potential and throw out your entertainment stand. With the included wall mount, it's easy to secure the Samsung HW-C451 to the wall alongside or underneath a wall mounted HDTV. So you can enjoy an elegant, cleaner living space.



Enhanced sound with Wireless Subwoofer

You'll really feel the sound with our 5.8 GHz wireless powered subwoofer, but you won't see it: since it's wireless, you can place it anywhere, even behind furniture or in a corner.



Specifications

General

- * 2.1 Channels
- * 280W Total Power

Audio Processing

- * Dolby Digital
- * DTS

Speakers

- * 2 Way 3 Front Speaker
- * Active Wireless Subwoofer
- * Bar Speaker

Connectivity

- * 1 Audio Input

Dimensions & Weight

- * 37.6" x 1.77" x 3.62"
- * 28.7 lbs.

Features and specifications are subject to change without prior notification

SONY DVD PLAYER**[RELATED SECTION 11 52 00]**

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of The Solar Homestead.

Model Number: DVP-SR200P

Location: Living Module

Dimension:

Width: 12-1/2"

Height: 1-1/4"

Depth: 8-1/4"

Weight: 2.65 lbs

Features:

Video digital-to-analog converter: 12 Bit, 108 MHz

Video formats: DVD-R DL read compatibility

DVD playback

Precision drive 3

Audio digital-to-analog converter: 16 Bit, 192 kHz

Electrical:

Wattage: 9 W

Voltage: 120 Vac

Frequency: 60 Hz

Approval Certificates:

Energy Star Qualified

Available: Best Buy



Model number: DVP-SR200P/B

DVD/CD Player

Complete your home theater system without compromising picture quality with this sleek DVD player.



ADDITIONAL IMAGES:



\$39.99

In Stock

Estimated ship date: 08/12/2011

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Bring home the latest on DVD.

[View all DVDs](#)

FEATURES

SPECIFICATIONS

REVIEWS

Product Specifications

Video

- Digital-to-Analog Converter : 12 Bit, 108MHz
- Format(s) Supported : DVD-R DL Read Compatibility - Yes¹

Hardware

- Remote Control : Yes

Convenience Features

- Instant Replay : Yes
- Instant Search : Yes
- Multiple Disc Resume : Yes
- On-Screen Display : Yes
- Smooth Slow : Yes

General Features

- Background Graphics : Yes

Weights and Measurements

- Dimensions (Approx) Depth : 8.23" (209mm)
- Dimensions (Approx) Height : 1.26" (32mm)
- Dimensions (Approx) Width : 12.6" (320mm)
- Weight (Approx.) : 2.65lbs (1.2kg)

Power

- Power Consumption (in Operation) : 9W
- Power Requirements : AC 120V, 60Hz

Video Features

- DVD (VR Mode) Playback : Yes (with no CPRM)¹
- DVD Playback : Yes¹
- DVD+R DL Read Compatibility : Yes¹
- DVD+R Read Compatibility : Yes¹
- DVD+RW Read Compatibility : Yes¹
- DVD-R Read Compatibility : Yes¹
- DVD-RW (VR Mode) Read Compatibility : Yes (with CPRM)¹
- DVD-RW Read Compatibility : Yes¹
- JPEG Playback : Yes¹
- Precision Drive 3 : Yes
- SVCD Playback : Yes¹
- Screen Saver : Yes
- VCD Playback : Yes¹

Audio Features

- CD Playback : Yes (CD, CD-R, CD-RW)¹
- Dolby® : Dolby® Digital
- Dolby® Digital Decoding : Yes
- MP3 Playback : Yes¹

General

- Disc Capacity : 1
- Energy Star Compliant : Yes
- Tray Type : Single Tray

Inputs and Outputs

- Coaxial Audio Digital Output(s) : 1 (Rear)
- Component Video (Y/Pb/Pr) Output(s) : 1 (Rear)
- Composite Video Output(s) : 1 (Rear)
- RCA Audio Output(s) : 1 (Rear)

Audio

- Digital-to-Analog Converter : 16 Bit, 192 kHz

SONY PLAYSTATION 3**[RELATED SECTION 11 52 00]**

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of The Solar Homestead.



Model Number: CECH 2501A

Location: Living Module

Dimension:

Width: 11-1/2"

Height: 2-1/2"

Depth: 11-1/2"

Weight: 6.6 lbs

Features:

Cell broadband engine

Audio output: LPCM 7.1ch, Dolby Digital, Dolby Digital Plus, Dolby TrueHD, DTS, DTS-HD, AAC

Memory: 256 MB XDR Main RAM, 256 MB GDDR3 VRAM

Hard disk: 2.5" Serial ATA 160 GB

Input/output: Hi-Speed USB 2

AV output Resolution: 1080p, 1080i, 720p, 480p, 480i

Electrical:

Wattage: 250 W

Voltage: 120 Vac

Frequency: 60 Hz

Available: Walmart

Specifications

Design and specifications are subject to change without notice. Information about system functionality and images published in this document may vary from those for your PS3™ system, depending on the system software version in use.

PlayStation®3 system

| | |
|---|---|
| CPU | Cell Broadband Engine™ |
| GPU | RSX™ |
| Audio output | LPCM 7.1ch, Dolby Digital, Dolby Digital Plus, Dolby TrueHD, DTS, DTS-HD, AAC |
| Memory | 256 MB XDR Main RAM, 256 MB GDDR3 VRAM |
| Hard disk | 160 GB*1*2 |
| Inputs/ outputs*3 | 2 |
| Networking | Ethernet (10BASE-T, 100BASE-TX, 1000BASE-T) x 1 IEEE 802.11 b/g Bluetooth® 2.0 (EDR) Wireless Controller (Bluetooth®) |
| Controller | Wireless Controller (Bluetooth®) |
| AV output | Resolution 1080p, 1080i, 720p, 480p, 480i HDMI OUT connector**4 1 AV MULTI OUT connector 1 Digital out (optical) connector 1 |
| BD/DVD/ CD drive (read only) | BD x 2 (BD-ROM) DVD x 8 (DVD-ROM) CD x 24 (CD-ROM) |

| | |
|--|--|
| Laser | Type: Semiconductor, continuous BD Wavelength: 400 - 410 nm Power: Max. 17.5 mW DVD Wavelength: 655 - 664 nm Power: Max. 2.6 mW CD Wavelength: 770 - 800 nm Power: Max. 4.0 mW |
| Power | 120 V AC, 60 Hz |
| Power consumption | Approx. 230 W |
| External dimensions (excluding maximum projecting part) | Approx. 290 x 65 x 290 mm (11.5 x 2.6 x 11.5 in) (width x height x length) |
| Mass | Approx. 3.0 kg (6.6 lb) |
| Operating temperature | 5°C - 35°C (41°F - 95°F) |

*1 Hard disk capacity calculated using base 10 mathematics (1GB = 1,000,000,000 bytes). The system software for this PS3™ system calculates capacity using binary mathematics (1GB = 1,073,741,824 bytes) and consequently displays lower capacity and free space. The difference in displayed values does not indicate a difference in the actual number of bytes.

*2 A portion of the hard disk capacity is reserved for use in connection with system administration, maintenance, and additional options. This may occur upon installation of system software or other software. As a result, the availability of hard disk capacity may vary depending on the system, system software version, or available options, and is not otherwise available for your use.

*3 Functionality of all connected devices is not guaranteed.

*4 "3D", "Deep Color", "x.v.Color" and "HD lossless audio format" are supported.

DUALSHOCK®3 Wireless Controller

| | |
|-------------------------|---|
| Battery type | Built-in rechargeable Lithium-Ion battery |
| Voltage | DC 3.7 V |
| Battery capacity | 610 mAh |
| Mass | Approx. 180 g (6.4 oz) |

DIVISION 12 **FURNISHINGS**

IKEA SINK CABINET

[RELATED SECTION 12 35 30.13]

Model Number: 798.705.00

Location: Living Module

Dimension:

Width: 29-7/8"

Height: 30-3/8"

Depth: 24-3/4"

Finish: Stainless Steel

Features:

3/4" Thick frame construction

Available: Ikea

Price: \$245.00





AKURUM

Base cabinet with sink w 2 drawers/2 fascia pan, white, Rubrik stainless steel

\$245.00

The price reflects selected options

Article Number: 798.705.00
 Cabinet number: AK SD

Hinges with snap-on function. Easy to fit on the door without screws, and make it easy to remove the door for cleaning.

[Read more](#)

Frame color

white

Front

Rubrik stainless steel

Size

30"

1

Buy at your local store

Choose

Product Information



AKURUM
 Base cabinet with sink w 2 drawers/2 fascia pan
\$245.00

Package measurement and weight

8 packages

[Show dimensions, weight and article numbers](#)

Key features

- Hinges with snap-on function. Easy to fit on the door without screws, and make it easy to remove the door for cleaning.
- Sturdy frame construction, 3/4" thick.
- Can be used with RATIONELL interior fittings for efficient utilization of the space.

Designer:

IKEA of Sweden

Product dimensions

Width: 29 7/8"
 Depth: 24 3/4"
 Height: 30 3/8"

Good to know

Different wall materials require different types of fasteners. Use fasteners suitable for the walls in your home (not included). The hinge is adjustable in height, depth and width. Legs are sold separately. To be completed with knobs or handles.

Care instructions

Wipe clean with a damp cloth. Use only water or a non-abrasive detergent. Wipe dry with a clean cloth.

Product description

Drawer front/ door:
 Main parts: Particleboard, Melamine foil
 Frontside: Stainless steel

Base cabinet frame:
 Frame: Particleboard, Polypropylene, Melamine foil
 Back: Fiberboard, Acrylic paint

False drawer hardware:
 Steel, Pigmented powder coating

Hinge:
 Hinge arm/ Pin/ Rivet/ Spring/ Screw/
 Mounting plate: Steel
 Plastic parts: Polyamide, Acetal plastic
 Metal parts: Zinc

More AKURUM/RATIONELL system



[Go to AKURUM/RATIONELL system](#)

IKEA BASE CABINET

[RELATED SECTION 12 35 30.13]

Model Number: 798.706.37

Location: Living Module

Dimension:

Width: 14-7/8"

Height: 30-3/8"

Depth: 24-3/4"

Finish: Stainless Steel

Features:

3/4" Thick frame construction

Drawer has damper for silent closing

Wire baskets for storage

Door can be mounted from left or right

Available: Ikea

Price: \$186.99





AKURUM

Base cab w wire basket/drawer/door, birch, Rubrik stainless steel

\$186.99

The price reflects selected options

Article Number: 798.706.37

Cabinet number: AK BDW1

Drawer with integrated damper that catches the running drawer so that it closes slowly, silently and softly. [Read more](#)

Frame color

birch effect

Front

Rubrik stainless steel

Size

15"

1

Buy at your local store

Choose

- Ideal for storage of pots, pans, frying pans, vessels etc
- Fully-extending drawer; for easy overview and access to the contents.
- Smooth-running drawer with drawer stop.
- The drawer is self-closing the last few inches.
- Can be used with RATIONELL interior fittings for efficient utilization of the space.
- The door can be mounted to open from the left or right.
- Sturdy frame construction, 3/4" thick.

- Base cabinet frame:
 - Main parts: Particleboard, Melamine foil
 - Back: Fiberboard, Acrylic paint
- Wire basket:
 - Main parts: Steel, Epoxy/polyester powder coating
 - Wheel: Acetal plastic
- Drawer damper:
 - Bumpers: Polyamide
 - Mounting plate: Steel, Galvanized
- Fully-extending drawer:
 - Drawer/ Drawer back: Steel, Pigmented epoxy/polyester powder coating
 - Drawer bottom: Particleboard, Melamine foil, Laminate (melamine foil)
 - Runners: Galvanized steel

Designer:
IKEA of Sweden

- Hinge:
 - Hinge arm/ Pin/ Rivet/ Spring/ Screw/ Mounting plate: Steel
 - Plastic parts: Polyamide, Acetal plastic
 - Metal parts: Zinc

Product dimensions
 Width: 14 7/8 "
 Depth: 24 3/4 "
 Height: 30 3/8 "

Width: 38 cm
 Depth: 62.8 cm
 Height: 77 cm

IKEA OVEN CABINET

[RELATED SECTION 12 35 30.13]

Model Number: 298.459.28

Location: Living Module

Dimension:

Width: 24"

Height: 30-3/8"

Depth: 24-3/4"

Finish: White

Available: Ikea

Price: \$120.99





AKURUM

Base cabinet for oven, birch, Abstrakt white

\$120.99

The price reflects selected options

Article Number: 298.459.28

Cabinet number: AK BO

[Read more](#)

Frame color

birch effect

Front

Abstrakt high gloss white

Size

24"

Buy at your local store

Choose

Store selection may vary and prices may differ from those online.

Package measurement and weight

4 packages

[Show dimensions, weight and article numbers](#)

Designer:

IKEA of Sweden

Product dimensions

Width: 24"
Depth: 24 3/4"
Height: 30 3/8"

Width: 61 cm
Depth: 63 cm
Height: 77 cm

This product requires assembly
[Download assembly instructions.](#)

Care instructions

Wipe clean with a damp cloth. Use only water or a non-abrasive detergent.
Wipe dry with a clean cloth.

Product description

Drawer front: Fiberboard
Main parts: Fiberboard
Front side/ Edge: Foil
Back side: Melamine foil

Base cabinet frame:
Main parts: Particleboard, Melamine foil
Back: Fiberboard, Acrylic paint

Fully-extending drawer:
Drawer/ Drawer back: Steel, Pigmented epoxy/polyester powder coating
Drawer bottom: Particleboard, Melamine foil, Laminate (melamine foil)
Runners: Galvanized steel

IKEA HIGH CABINET

[RELATED SECTION 12 35 30.13]

Model Number: 298.697.83

Location: Living Module

Dimension:

Width: 15"

Height: 88"

Depth: 24-3/4"

Finish: Harlig White

Features:

3/4" Thick frame construction

Drawer has damper for silent closing

Wire baskets for storage

2 Reinforced shelves

Door can be mounted from left or right

Available: Ikea

Price: \$399.95





AKURUM

High cab w pull-out storage/2 doors, white, Härlig white

\$399.95

The price reflects selected options

Article Number: 298.697.83

Cabinet number:: AK HP

153° opening angle; makes it easy to reach and pull out fully-extending drawers from a high cabinet, etc. [Read more](#)

Frame color

white

Front

Härlig white

Size

24x88x24 "

Buy at your local store

Choose

- Sturdy frame construction, 3/4" thick.
- Hinges with snap-on function. Easy to fit on the door without screws, and make it easy to remove the door for cleaning.
- Can be used with RATIONELL interior fittings for efficient utilization of the space.

Designer:

IKEA of Sweden

Product dimensions

Frame, width: 24 "
Depth: 24 1/8 "
Frame, height: 88 "

Frame, width: 61 cm
Depth: 61.2 cm
Frame, height: 223.5 cm

This product requires assembly
[Download assembly instructions.](#)

Fully-extending drawer:
Drawer/ Drawer back: Steel, Pigmented epoxy/polyester powder coating
Drawer bottom: Particleboard, Melamine foil, Laminate (melamine foil)
Runners: Galvanized steel

Hinge:
Hinge arm/ Pin/ Rivet/ Spring/ Screw/
Mounting plate: Steel
Plastic parts: Polyamide, Acetal plastic
Metal parts: Zinc

Deep drawer front/ drawer front:
Main parts: Anodized aluminum
Plastic parts: Acetal plastic

Drawer damper:
Bumpers: Polyamide
Mounting plate: Steel, Galvanized

IKEA CABINET COVER

[RELATED SECTION 12 35 30.13]

Model Number: 101.418.44

Location: Living Module

Dimension:

Width: 25-1/8"

Height: 92-3/4"

Depth: 3/4"

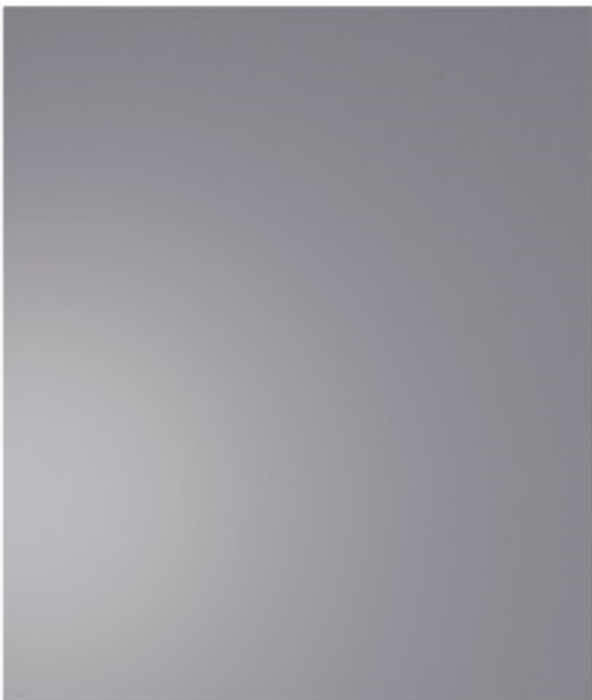
Weight: 47 lbs

Finish: Stainless Steel

Available: Ikea

Price: \$105.00





RUBRIK

Cover panel for high cabinet, stainless steel

\$105.00

The price reflects selected options

Article Number: 101.418.44

Magnetic cover panel can be used as a bulletin board as well. [Read more](#)

Size

88"

1

Buy at your local store

Choose

Store selection may vary and prices may differ from those online.

More Models



Product Information



RUBRIK
Cover panel for high cabinet
\$105.00

Package measurement and weight

Packages: 1
Article Number: 101.418.44
Width: 25 1/8"
Height: 3/4"
Length: 92 3/4"
Weight: 47lb
Quantity: 1

Good to know

Screws Included.

Care instructions

Wipe clean with a damp cloth. Use only water or a non-abrasive detergent.
Wipe dry with a clean cloth.

Product description

Main parts: Particleboard, Melamine foil
Frontside: Stainless steel

More AKURUM/RATIONELL system



[Go to AKURUM/RATIONELL system](#)

IKEA WALL SHELF

[RELATED SECTION 12 35 30.13]



Model Number: 000.114.28

Location: Living Module

Dimension:

Length: 47-1/4"

Depth: 10-5/8"

Height: 7-7/8"

Weight: 5 lbs

Finish: Stainless Steel

Available: Ikea

Price: \$26.99

GRUNDTAL

Wall shelf, stainless steel

\$26.99

The price reflects selected options

Article Number: 700.227.63

Saves space on the countertop Can also be used as a pot lid holder. [Read more](#)

Size

47 1/4 "

Sorry, this product is not for sale on our website, check if it is available in your local store.



Package measurement and weight

Packages: 1
Article Number: 700.227.63
Width: 8 1/2"
Height: 1 5/8"
Length: 47 7/8"
Weight: 8lb
Quantity: 1

Article Number: 700.227.63
Width: 22 cm
Height: 4 cm
Length: 122 cm
Weight: 3.7 kg
Quantity: 1

Care instructions

Wipe clean with a soft cloth dampened with water and a mild dish detergent or soap, if necessary.
Wipe dry with a clean cloth.

Product description

Stainless steel

Key features

- Saves space on the countertop
- Can also be used as a pot lid holder.
- Can be used in high humidity areas.

Designer:

Mikael Warnhammar

Product dimensions

Length: 47 1/4 "
Depth: 10 5/8 "
Height: 7 7/8 "
Hole spacing: 46 1/8 "

Length: 120 cm
Depth: 27 cm
Height: 20 cm
Hole spacing: 117 cm

IKEA CABINET GRIP

[RELATED SECTION 12 35 30.13]

Model Number: 700.919.78

Location: Living Module

Dimension:

Depth: 5/8"

Finish: Stainless Steel

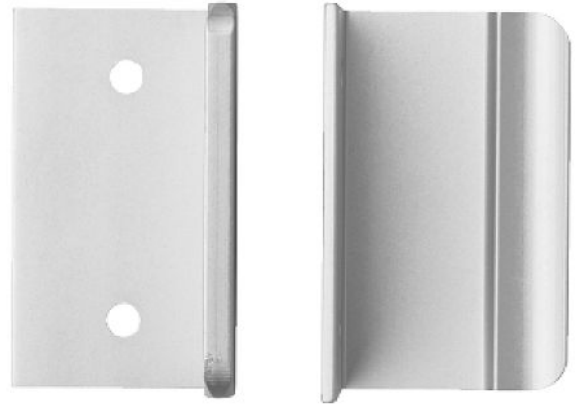
Features:

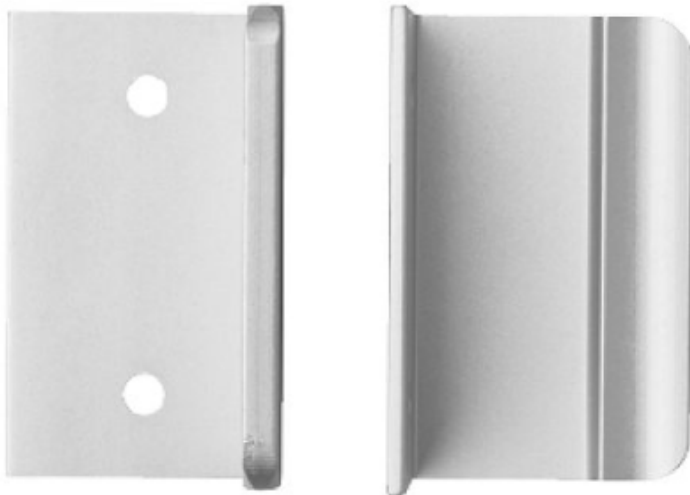
Package contains 2 grips

Hole Spacing: 1-1/4"

Available: Ikea

Price: \$3.99





GRIP

Handle, aluminum

\$3.99 / 2 pack

Article Number: 700.919.78

[Read more](#)

Complementary Products



[View all complementary products](#)

Buy at your local store

Store selection may vary and prices may differ from those online.

Complementary Products

Product information



GRIP
Handle
\$3.99

Good to know
Suitable for door 1/4" thick.
Screws included.

Care instructions
Wipe clean with a damp cloth. Use only water or a non-abrasive detergent.
Wipe dry with a clean cloth.

Product description
Aluminum

Package measurement and weight
Packages: 1
Article Number: 700.919.78
Width:
Height:
Length:
Weight: 0lb
Quantity: 1

More AKURUM/RATIONELL system



[Go to AKURUM/RATIONELL system](#)

IKEA PLINTH

[RELATED SECTION 12 35 30.13]



Model Number: 001.451.97

Location: Living Module

Dimension:

Length: 88"

Height: 4-1/4"

Depth: 5/8"

Finish: Stainless Steel

Features:

Extra edging strip included

Cut to length

Available: Ikea

Price: \$15.00

PERFEKT

Plinth, stainless steel color

\$15.00

The price reflects selected options

Article Number: 001.451.97

Extra edging strip included. The plinth can be cut to desired length. [Read more](#)

Color

stainless steel color

1

Buy at your local store

Choose

Store selection may vary and prices may differ from those online.

Assembly instructions

[PERFEKT Plinth](#) (PDF)



Color



Product information



PERFEKT
Plinth
\$15.00

Package measurement and weight

Packages: 1
Article Number: 001.451.97
Width: 7 1/2"
Height: 7/8"
Length: 94 1/2"
Weight: 8lb
Quantity: 1

Good to know

Hardware for mounting the plinth are included with AKURUM legs.
Wall strip for use in installation of wall cabinet and base cabinet included.

Care instructions

Wipe clean using a damp cloth and a mild cleaner.
Wipe dry with a clean cloth.

Product description

Particleboard, Foil

More AKURUM/RATIONELL system



[Go to AKURUM/RATIONELL system](#)

IKEA VANITY

[RELATED SECTION 12 35 30.23]

Model Number: 498.941.97

Location: Flex Bath

Dimension:

Width: 31-1/2"

Height: 36-1/4"

Depth: 16-1/8"

Finish: White

Features:

Includes Sink Bowl

Shelf Edge for Soap

Available: Ikea

Price: \$283.00





LILLÅNGEN

Sink cabinet/2 doors/2 end units, white

\$283.00

The price reflects selected options

Article Number: 498.941.97

Shelf-like edge can hold a soap dish, a toothbrush holder, etc. [Read more](#)

Color

white

1

Sorry, this product is not for sale on our website, check if it is available in your local store.

Buy at your local store

Chicago

Store selection may vary and prices may differ from those online.

Assembly instructions

[Download \(PDF\)](#)

Designer:

Inma Bermudez/IKEA of Sweden

Product dimensions

Width: 31 1/2 "

Depth: 16 1/8 "

Height: 36 1/4 "

Width: 80 cm

Depth: 41 cm

Height: 92 cm

This product requires assembly

[Download assembly instructions.](#)

Product description

Sink, 1 bowl:

Main parts: Ceramic, Colored glaze

Main parts: Stainless steel

Water trap: Polypropylene

Seal: Synthetic rubber

Pop-up valve: Stainless steel, Brass,

Chrome plated

Sink cabinet with 2 doors:

Frame/ Shelf: Particleboard, Foil, ABS plastic

Door: Fiberboard, Foil, ABS plastic,

Melamine foil

End unit:

Particleboard, Foil, ABS plastic

IKEA BUTCHER BLOCK

[RELATED SECTION 12 36 19]

Model Number: 000.864.14

Location: Living Module

Dimension:

Length: 49-5/8"

Thickness: 1-1/2"

Depth: 25-5/8"

Finish: Birch

Features:

Cut to Size

Available: Ikea

Price: \$89.00





NUMERÄR

Countertop, birch

\$89.00

The price reflects selected options

Article Number: 000.864.14

Solid wood; can be cut to length, sanded and surface treated as required. [Read more](#)

Size

49 5/8x25 5/8 "

Complementary Products



[View all complementary products](#)

Package measurement and weight

Packages: 1
 Article Number: 000.864.14
 Width: 26"
 Height: 1 7/8"
 Length: 51 1/8"
 Weight: 44lb
 Quantity: 1

Article Number: 000.864.14
 Width: 66 cm
 Height: 5 cm
 Length: 130 cm
 Weight: 20 kg
 Quantity: 1

Care instructions

Wipe clean with a soft cloth dampened with water and a mild dish detergent or soap, if necessary.
 Wipe dry with a clean cloth.
 Light stains can be removed with a damp sponge in water or a mild soapy solution, or with a fine sandpaper.
 Regular treatment with BEHANDLA wood treatment oil prolongs the life of the countertop.

Product description

Solid birch, Oil

Key features

- Solid wood; can be cut to length, sanded and surface treated as required.

Designer:

IKEA of Sweden

Product dimensions

Length: 49 5/8 "
 Depth: 25 5/8 "
 Thickness: 1 1/2 "

Length: 126 cm
 Depth: 65 cm
 Thickness: 3.8 cm

DIVISION 21 **FIRE-SUPPRESSION**

POTTER WATERFLOW ALARM SWITCH

[RELATED SECTION 21 05 19]

Model Number: VSR-S

Location: Main House Mechanical Closet, Outdoor Kitchen Mechanical Closet

Dimensions:

Length: 5.56" [141.2 mm]

Width: 3.5" [89 mm]

Height: 2.34" [59.4 mm]

Finish: die-cast, red enamel

Features:

Service pressure: 300 psi [20.7 bar]

Maximum surge: 18 fps [5.5 m/s]

Flow sensitivity range for signal: 4-10 gpm [15-38 lpm]

Approval Certificates:

UL Listed

ULC Listed

CSFM Listed

NYMEA Accepted

Available: Lowes





Stock No. 1144440

⚠ WARNING

Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.

Shock hazard. Disconnect power source before servicing. Serious injury or death could result.

Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

UL, ULC, CSFM Listed and NYMEA Accepted

Service Pressure: Up to 300 PSI (20,7 BAR)

Flow Sensitivity Range for Signal: 4-10 GPM (15-38 LPM) UL

Maximum Surge: 18 FPS (5,5 m/s)

Enclosure: Die-cast, red enamel finish

Cover held in place with tamper resistant screws

Contact Ratings: Two sets of SPDT (Form C)

10.0 Amps at 125/250 VAC

2.0 Amps at 30 VDC Resistive

10mAmps min. at 24 VDC

Conduit Entrances: Two openings provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Usage: Listed plastic, copper and schedule 40 iron pipe.

Fits pipe sizes - 1" (25mm), 1 1/4" (32mm), 1 1/2" (38mm) and 2" (50mm)

Note: 12 paddles are furnished with each unit, one for each pipe size of threaded and sweat TEE, one for 1" (25mm) CPVC, one for 1" (25mm) CPVC (Central), one for 1" threaded Nibco CPVC, and one for 1 1/2" (38mm) threaded (Japan).

Environmental Specifications:

- NEMA-4/IP54 Rated enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature range: 40° F to 120° F, (4,5° C to 49° C) UL

Service Use:

Automatic Sprinkler

One or two family dwelling

Residential occupancy up to four stories

National Fire Alarm Code

NFPA-13

NFPA-13D

NFPA-13R

NFPA-72

Optional: Cover Tamper Switch Kit, Stock No. 0090148

(See Fig. 7 for terminations)

Replaceable Components: Retard/Switch Assembly, stock no. 1029030

The Model VSR-S is a vane type waterflow switch for use on wet sprinkler systems that use 1" (25mm), 1 1/4" (32mm), 1 1/2" (38mm) or 2" (50mm) pipe size. The unit may also be used as a sectional waterflow detector on large systems.

The unit contains two single pole double throw snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 gallons per minute (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR-S switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

Installation

These devices may be mounted in horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The units should not be installed within 6" (15cm) of a valve, drain or fitting which changes the direction of the waterflow. Select the proper paddle for the pipe size and type of TEE used see Fig. 1 for instructions on changing paddle. The unit has a 1" NPT bushing for threading into a non-corrosive TEE. See Fig. 2 for proper TEE size, type and installation. Use no more than three wraps of teflon tape.

Screw the device into the TEE fitting as shown in Fig. 2. Care must be taken to properly orient the device for the direction of waterflow.

The vane must not rub the inside of the TEE or bind in any way. The stem should move freely when operated by hand.

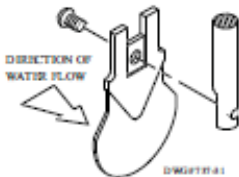
The device can also be used in copper or plastic pipe installations with the proper adapters so that the specified TEE fitting may be installed on the pipe run.

Note: Do not leave cover off for an extended period of time.

Fig. 1

Retard Adjustment

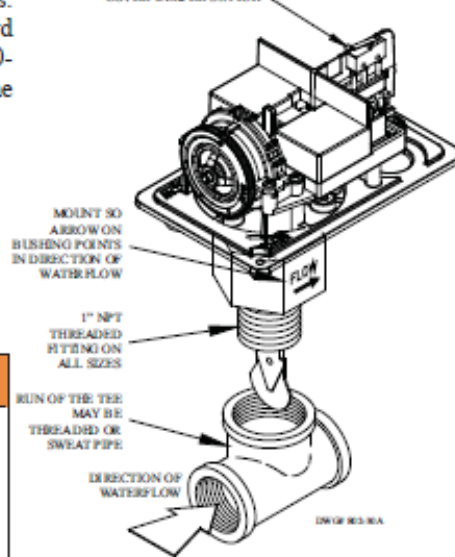
The time delay is factory set at 30 ± 10 seconds. The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms.



WARNING

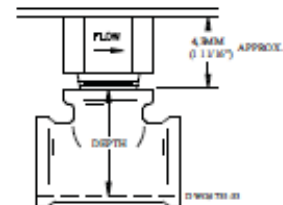
There are 12 paddles furnished with each unit. One for each size of threaded, sweat or plastic TEE as described in Fig. 2. These paddles have raised lettering that shows the pipe size and type of TEE that they are to be used with. The proper paddle must be used. The paddle must be properly attached (see drawing) and the screw that holds the paddle must be securely tightened.

DO NOT LEAVE COVER OFF FOR EXTENDED PERIOD OF TIME
COVER TAMPER SWITCH



Shown with optional Cover Tamper Switch Kit.

Fig. 2



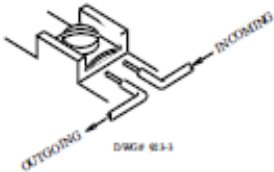
Screw the device into the tee fitting as shown. Care must be taken to properly orient the device for the direction of waterflow. On sweat tees, no threaded bushings, inserts, or adapters are permitted, unless they comply with the dimensions listed in the chart below. **Important** - The depth to the inside bottom of the tee should have the following dimensions:

| Approximate Depth Requirement | | | |
|-------------------------------|----------|---------|---------|
| TEE SIZE | THREADED | SWEAT | CPVC |
| 1" x 1" x 1" | 2 1/16" | 1 3/4" | 2 7/16" |
| 1 1/4" x 1 1/4" x 1" | 2 7/16" | 2 7/16" | N/A |
| 1 1/2" x 1 1/2" x 1" | 2 11/16" | 2 1/4" | N/A |
| 2" x 2" x 1" | 3 3/16" | 2 3/4" | N/A |

WARNING

Do not use more than three wraps of teflon tape.

Fig. 3 Switch Terminal Connections Clamping Plate Terminal



WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Fig. 7 Cover Tamper Switch Wiring (Shown with cover in place)

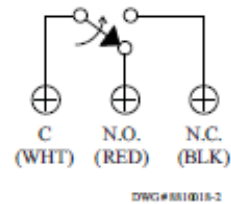
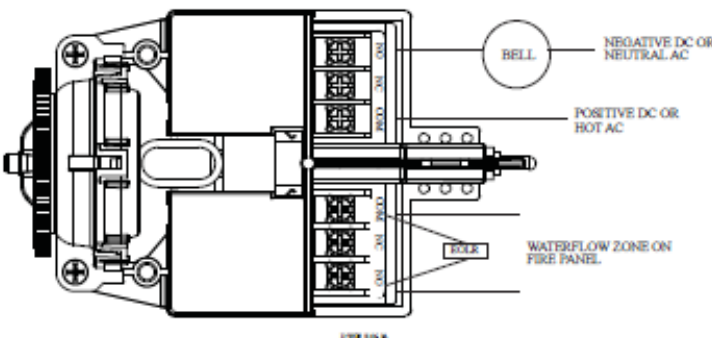


Fig. 4 Typical Electrical Connections



Notes:

- The Model VSR-S has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other is used to operate a local audible or visual annunciator.
- For supervised circuits see "Switch Terminal Connections" drawing and caution note (Fig. 3).

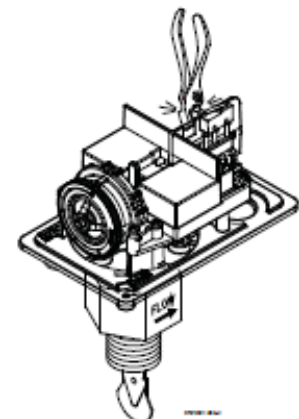
Fig. 5

To remove knockouts: Place screwdriver at edge of knockouts, not in the center.



Fig. 6

Break out thin section of cover when wiring both switches from one conduit entrance.



Testing

The frequency of inspection and testing for the Model VSR-S and its associated protective monitoring system should be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently.)

An inspector's test valve (usually located at the end of the most remote branch line) should always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-S is not recommended or advisable.

A minimum flow of 10 gpm (38 Lpm) is required to activate this device.

NOTICE Please advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Maintenance

Inspect detectors monthly for leaks. If leaks are found, replace the detector. The VSR-S waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030. There is no maintenance required, only periodic testing and inspection.

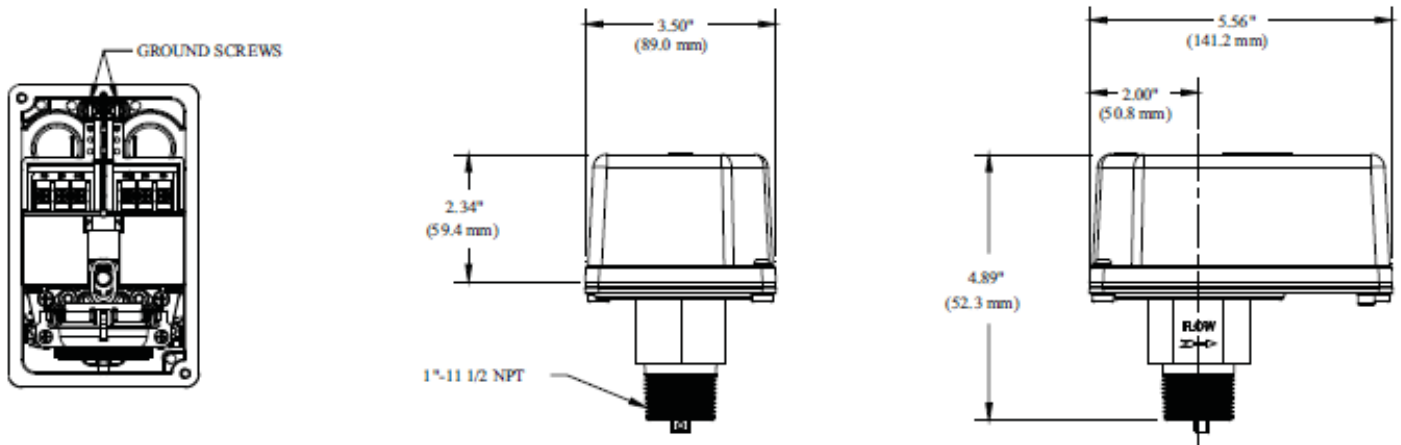
Removal

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Use a wrench on the flats of the bushing. Turn the switch counterclockwise to disengage the pipe threads.
- Gently lift with your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector.
- Lift detector clear of pipe.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Mounting Dimensions



DWG# 1206-5

PROPLUMBER PRESSURE GAUGE

[RELATED SECTION 21 05 19]

Model Number: PP100G

Location: Main House Mechanical Closet, Outdoor Kitchen Mechanical Closet

Dimensions:

Diameter: 1" [25.4 mm]

Finish: steel

Features:

Maximum rated pressure: 100 psi

Available: Lowes





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ProPlumber Pressure Gauge

Item #: 64124 | Model #: PP100G

★★★★★ [1 review](#) | [Write a review](#)

\$8.52

Customers Also Viewed



Aqua EZ Side Mount Pressure Gauge with Metal...

★★★★★
\$9.95



ProPlumber Pressure Gauge

Not Yet Rated
\$7.97



ProPlumber 40/60 Pressure Switch

Not Yet Rated
\$23.54



Kobalt Analog Pressure Gauge

Not Yet Rated
\$3.98



ProPlumber 10" Tank Tee

Not Yet Rated
\$31.68

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| | | | |
|-------------------------|----------------|------------------|---------------------|
| Type | Pressure gauge | Package Quantity | 1.0 |
| Material | Steel | Package Contents | 100# pressure gauge |
| Accessory Size (Inches) | 1.0 | | |

VICTAULIC K4.2 RESIDENTIAL HORIZONTAL SIDEWALL SPRINKLER

[RELATED SECTION 21 10 00]

Model Number: V2738

Location: Flex Space, Bedrooms, Main House Mechanical Closet, Laundry Closet

Finish: White

Features:

K-factor: K4.2 - 6.1

Thread size: 1/2" [15 mm]

UL pressure: 175 psi [1200 kPa]

Sprinkler temperature range: 155°F - 175°F [68°C - 79°C]

Approval Certificates:

UL

ULC

Available: Victaulic



VICTAULIC K5.6 RESIDENTIAL HORIZONTAL SIDEWALL SPRINKLER

[RELATED SECTION 21 10 00]

Model Number: V2744

Location: Living Module

Finish: White

Features:

K-factor: K5.6 - 8.1

Thread size: 1/2" [15 mm]

UL pressure: 175 psi [1200 kPa]

Sprinkler temperature range: 155°F - 175°F [68°C - 79°C]

Approval Certificates:

UL

ULC

Available: Victaulic



VICTAULIC K4.9 RESIDENTIAL CONCEALED PENDENT SPRINKLER

[RELATED SECTION 21 10 00]

Model Number: V2734

Location: Hallways, Bedroom Closets

Finish: White

K-factor: K4.9 – 7.1

Thread size: 1/2" [15 mm]

UL pressure: 175 psi [1200 kPa]

Sprinkler temperature range: 155°F - 175°F [68°C - 79°C]

Approval Certificates:

UL

ULC

Available: Victaulic



VIKING BLAZEMASTER 3/4" CPVC PIPING

[RELATED SECTION 21 10 00]

Model Number: 34 PIPE

Location: throughout The Solar Homestead

Dimensions:

Diameter: 3/4" [19 mm]

Length: 15' [4.6 m]

Available: The Viking Corporation



Features

- **Sizes Available (Nominal):** 3/4" (DN20) through 3" (DN80) pipe diameters, with a Standard Dimension Ratio (SDR) of 13.5 as specified in ASTM F442.
- **Environmental Specifications:** Indoor use only.
Maximum Ambient Temperature: 150°F (65°C)
- **Hazen-Williams C Value:** 150
- **Pressure Data: Working Pressure:** 175 PSI (12.1 bar) at 150°F (65°C)
- **Specifications:**
 - Meets NFPA 13R and 13D standards for residential occupancies as well as NFPA 13 standards for light hazard occupancies.
 - Pipe meets or exceeds ASTM F442.
 - Certified by NSF International for potable water services.
 - CPVC pipe from Viking Plastics use compound cell class 23547 (demonstrated highest structural properties).
 - cULus Listed, FM Approved, New York City (MEA) Approved, LPCB Approved.



CPVC PIPE PHYSICAL DATA

| Nominal Pipe Size | | Actual Outside Diameter | | Average Inside Diameter | | *Weight per 15' (4,6 m) length | | Length | | Approvals | Part Number |
|-------------------|------|-------------------------|--------|-------------------------|--------|---------------------------------|-------|--------|------|----------------|-------------|
| Inch | DN | Inch | mm | Inch | mm | Lb. | Kg. | Feet | M | | |
| 3/4" | DN20 | 1.050 | 26,670 | 0.874 | 22,199 | 2.52 | 1,14 | 15 | 4.6 | cULus, FM, NSF | 34PIPE |
| 1" | DN25 | 1.315 | 33,401 | 1.101 | 27,965 | 3.93 | 1,78 | 15 | 4.6 | | 1PIPE |
| 1 1/4" | DN32 | 1.660 | 42,164 | 1.394 | 35,408 | 6.27 | 2,84 | 15 | 4.6 | | 114PIPE |
| 1 1/2" | DN40 | 1.900 | 48,260 | 1.598 | 40,589 | 8.22 | 3,73 | 15 | 4.6 | | 112PIPE |
| 2" | DN50 | 2.375 | 60,325 | 2.003 | 50,876 | 12.89 | 5,85 | 15 | 4.6 | | 2PIPE |
| 2 1/2" | DN65 | 2.875 | 73,000 | 2.423 | 61,500 | 18.86 | 8,55 | 15 | 4.6 | | 212PIPE |
| 3" | DN80 | 3.500 | 88,900 | 2.950 | 74,900 | 28.01 | 12,71 | 15 | 4.6 | | 3PIPE |
| Nominal Pipe Size | | Actual Outside Diameter | | Average Inside Diameter | | *Weight per 10' (3,05 m) length | | Length | | Approvals | Part Number |
| Inch | DN | Inch | mm | Inch | mm | Lb. | Kg. | Feet | M | | |
| 3/4" | DN20 | 1.050 | 26,670 | 0.874 | 22,199 | 1.68 | 0,76 | 10 | 3,05 | cULus, FM, NSF | 34PIPE10 |
| 1" | DN25 | 1.315 | 33,401 | 1.101 | 27,965 | 2.62 | 1,19 | 10 | 3,05 | | 1PIPE10 |
| 1 1/4" | DN32 | 1.660 | 42,164 | 1.394 | 35,408 | 4.18 | 1,90 | 10 | 3,05 | | 114PIPE10 |
| 1 1/2" | DN40 | 1.900 | 48,260 | 1.598 | 40,589 | 5.48 | 2,49 | 10 | 3,05 | | 112PIPE10 |
| 2" | DN50 | 2.375 | 60,325 | 2.003 | 50,876 | 8.59 | 3,90 | 10 | 3,05 | | 2PIPE10 |
| 2 1/2" | DN65 | 2.875 | 73,000 | 2.423 | 61,500 | 12.57 | 5,70 | 10 | 3,05 | | 212PIPE10 |
| 3" | DN80 | 3.500 | 88,900 | 2.950 | 74,900 | 18.67 | 8,47 | 10 | 3,05 | | 3PIPE10 |

NOTE: CPVC Pipe is produced in SDR 13.5 Dimensions in accordance with ASTM F442. Standard Dimension Ratio is the ratio of the outside pipe diameter to the wall thickness of the pipe.

Blazemaster® is a registered trademark of Lubrizol.

Specifications subject to change without notice

*Empty pipe weights

IMPORTANT: Installers should receive thorough hands-on training in the proper methods of assembly and installation of CPVC products.

NIBCO BLAZEMASTER BRASTIC SPRINKLER HEAD ADAPTERS

[RELATED SECTION 21 10 00]

Model Number: 5003-S-BT

Location: throughout The Solar Homestead

Weight: 0.16 lbs [73 g]

Features:

Joint: SXSXS

Available: NIBCO



BlazeMaster
FIRE SPRINKLER FITTINGS

FEATURES

- Available in 3/4" x 1/2" and 1" x 1/2"
- Complies with NFPA-13, 13R and 13D requirements
- Use sprinkler manufacturer's wrench for sprinkler install or removal (**No special wrench required to remove sprinkler head**)
- Large lead chamfer will not remove PTFE tape or thread sealant upon sprinkler assembly
- No lead-containing metal in contact with fluid. NSF Certified for compliance with NSF/ANSI 61, Annex G (Approved for use with potable water intended for human consumption)
- Dezincification and corrosion resistant
- Wide wrench flats for hold back
- Reduced sprinkler installation torque vs. brass
- Made in USA
- U.S. Patent 6,186,558



**THE NEW PATENTED
NIBCO[®] BRASTIC[™]
SPRINKLER HEAD ADAPTER
REINVENTS
SPRINKLER INSTALLATION**

UNIQUE DESIGN PROVIDES GREATER RESISTANCE TO RADIAL STRESS ALONG THE ENTIRE LENGTH OF THE SEALING THREADS

SPRINKLER SEALS ENTIRELY AGAINST CPVC WHEN PROPERLY INSTALLED ELIMINATING A POTENTIAL LEAK PATH

IMPROVED TORQUE PERFORMANCE

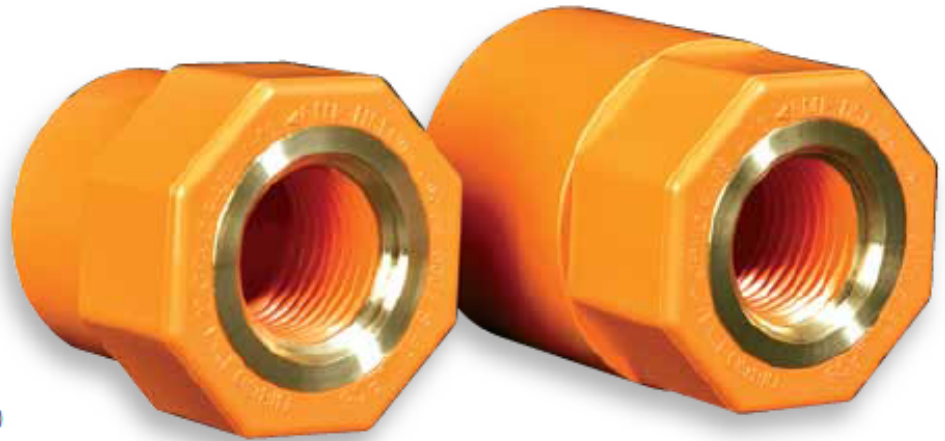
ROBUST STARTER THREAD TO PREVENT SPRINKLER CROSS THREADING

BRASTIC™ Sprinkler Head Adapters

SIZE RANGE – 3/4" x 1/2" and 1" x 1/2" (Socket x FNPT)

FEATURES –

- Sprinkler seals entirely against CPVC when properly installed eliminating a potential leak path
- Unique design provides greater resistance to radial stress along the entire length of the sealing threads
- Robust starter thread to prevent sprinkler cross threading
(Large lead chamfer will not remove PTFE tape or thread sealant upon sprinkler assembly)
- Use sprinkler manufacturer's wrench for sprinkler install or removal
(No special wrench required to remove sprinkler head)
- No lead-containing metal in contact with fluid. NSF Certified for compliance with NSF/ANSI 61, Annex G.
(Approved for use with potable water intended for human consumption)
- Dezincification and corrosion resistant
- Wide wrench flats for hold back
- Improved torque resistance
- Made in USA
- U.S. Patent 6,186,558

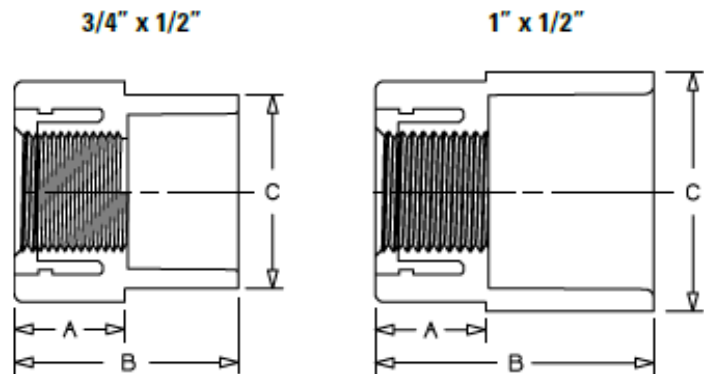


LISTINGS AND APPROVALS –

- UL 1821 Listed
 - Exposed system risers NFPA 13D, 13R
 - Exposed basement NFPA 13D (solid wood joist)
 - Extended coverage (exposed)
 - 20' spacing on pendent in lieu of 15'
 - Exposed extended coverage sidewall sprinkler listing for exposed pipe & fittings
 - Permitted for use with return air plenums with no set-back at ceiling openings per NFPA 90A
- ULC Listed
- Factory Mutual Approved
 - Factory Mutual Approval exposed
 - Factory Mutual Approval above drop-in ceilings
- LPCB Approved
- NSF Certification -pw Annex-G

INSTALLATION INSTRUCTIONS –

For complete installation instructions see NIBCO's "Installation and Design Manual" or for Brastic installation instructions reference form No. IM-BLBF-0910.



| UNIV. FIG. NO. | NOM. SIZE | APPROX. NET WT./LBS. | DIM. A INCHES | DIM. B INCHES | DIM. C INCHES | JOINT |
|----------------|-------------|----------------------|---------------|---------------|---------------|----------|
| 5003-S-BT | 1" x 1/2" | 0.17 | .75 | 1.89 | 1.625 | S x FNPT |
| 5003-S-BT | 3/4" x 1/2" | 0.15 | .75 | 1.52 | 1.315 | S x FNPT |

NIBCO BLAZEMASTER TEES

[RELATED SECTION 21 10 00]

Model Number: 5011

Location: throughout The Solar Homestead

Weight: 0.10 lbs [45 g]

Features:

Joint: SXFNPT

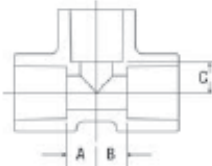
Available: NIBCO



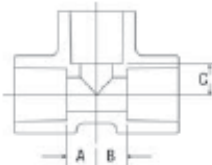
BlazeMaster® Fire Protection Fittings – STANDARD

TEES

5011



5011-R



Tees

| UNIV. FIG. NO. | NOM. NOM. SIZE | APPROX. NET WT./LBS. | DIM. A INCHES | DIM. B INCHES | DIM. C INCHES | JOINT |
|----------------|----------------------|----------------------|---------------|---------------|---------------|-------|
| 5011 | 3/4" | 0.10 | 0.57 | 0.57 | 0.57 | SXSXS |
| 5011 | 1" | 0.17 | 0.69 | 0.69 | 0.69 | SXSXS |
| 5011 | 1-1/4" | 0.28 | 0.89 | 0.89 | 0.89 | SXSXS |
| 5011 | 1-1/2" | 0.58 | 1.05 | 1.05 | 1.05 | SXSXS |
| 5011 | 2" | 0.82 | 1.25 | 1.25 | 1.25 | SXSXS |
| 5011 | 2-1/2" | 1.58 | 1.53 | 1.53 | 1.53 | SXSXS |
| 5011 | 3" | 2.14 | 1.84 | 1.84 | 1.84 | SXSXS |
| 5011-R | 3/4"x3/4"x1" | 0.14 | 0.70 | 0.70 | 0.73 | SXSXS |
| 5011-R | 1"x1"x3/4" | 0.16 | 0.61 | 0.61 | 0.94 | SXSXS |
| 5011-R | 1"x3/4"x1" | 0.20 | 0.76 | 0.99 | 0.78 | SXSXS |
| 5011-R | 1"x3/4"x3/4" | 0.16 | 0.60 | 0.87 | 0.77 | SXSXS |
| 5011-R | 1-1/4"x1-1/4"x1" | 0.24 | 0.73 | 0.73 | 0.89 | SXSXS |
| 5011-R | 1-1/4"x1-1/4"x3/4" | 0.20 | 0.60 | 0.60 | 0.89 | SXSXS |
| 5011-R | 1-1/4"x1"x1-1/4" | 0.28 | 0.88 | 1.03 | 0.87 | SXSXS |
| 5011-R | 1-1/4"x1"x1" | 0.24 | 0.71 | 0.90 | 0.89 | SXSXS |
| 5011-R | 1-1/4"x1"x3/4" | 0.20 | 0.61 | 0.76 | 0.89 | SXSXS |
| 5011-R | 1-1/4"x1-1/4"x1-1/2" | 0.44 | 1.01 | 1.01 | 0.88 | SXSXS |
| 5011-R | 1-1/2"x1-1/2"x1-1/4" | 0.46 | 0.89 | 0.89 | 1.04 | SXSXS |
| 5011-R | 1-1/2"x1-1/2"x1" | 0.54 | 0.77 | 0.77 | 0.96 | SXSXS |
| 5011-R | 1-1/2"x1-1/2"x3/4" | 0.50 | 0.67 | 0.67 | 1.04 | SXSXS |
| 5011-R | 1-1/2"x1-1/4"x1" | 0.40 | 0.72 | 0.91 | 1.01 | SXSXS |
| 5011-R | 1-1/2"x1-1/4"x3/4" | 0.36 | 0.60 | 0.78 | 1.02 | SXSXS |
| 5011-R | 1-1/2"x1-1/2"x2" | 0.88 | 1.30 | 1.30 | 1.14 | SXSXS |
| 5011-R | 2"x2"x1-1/2" | 0.86 | 1.06 | 1.06 | 1.37 | SXSXS |
| 5011-R | 2"x2"x1-1/4" | 0.67 | 1.00 | 1.00 | 1.28 | SXSXS |
| 5011-R | 2"x2"x1" | 0.72 | 0.80 | 0.80 | 1.25 | SXSXS |
| 5011-R | 2"x2"x3/4" | 0.68 | 0.70 | 0.70 | 1.25 | SXSXS |
| 5011-R | 2-1/2"x2-1/2"x2" | 1.32 | 1.26 | 1.26 | 1.53 | SXSXS |
| 5011-R | 2-1/2"x2-1/2"x1-1/2" | 1.21 | 1.06 | 1.06 | 1.53 | SXSXS |
| 5011-R | 2-1/2"x2-1/2"x1-1/4" | 1.12 | 0.91 | 0.91 | 1.53 | SXSXS |
| 5011-R | 2-1/2"x2-1/2"x1" | 1.05 | 0.74 | 0.74 | 1.53 | SXSXS |
| 5011-R | 3"x3"x2-1/2" | 1.71 | 1.53 | 1.53 | 1.84 | SXSXS |
| 5011-R | 3"x3"x2" | 1.56 | 1.26 | 1.26 | 1.84 | SXSXS |
| 5011-R | 3"x3"x1-1/2" | 1.39 | 1.06 | 1.06 | 1.82 | SXSXS |

Note: All NIBCO reducing tees are molded to size, not fabricated.

GRUNDFOS 2 HORSEPOWER PUMP

[RELATED SECTION 21 16 00]

Model Number: JPF7A

Location: underneath Outdoor Shower

Dimensions:

Length: 25-1/2"

Width: 12-1/2"

Height: 10"

Weight: 70 lbs

Finish: Cast iron

Features:

Flow range: 2.6-35 gpm

Maximum working pressure: 110 psi

Maximum fluid temperature range: 14°F - 104°F [-10°C - 40°C]

Electrical:

Wattage: 240 W

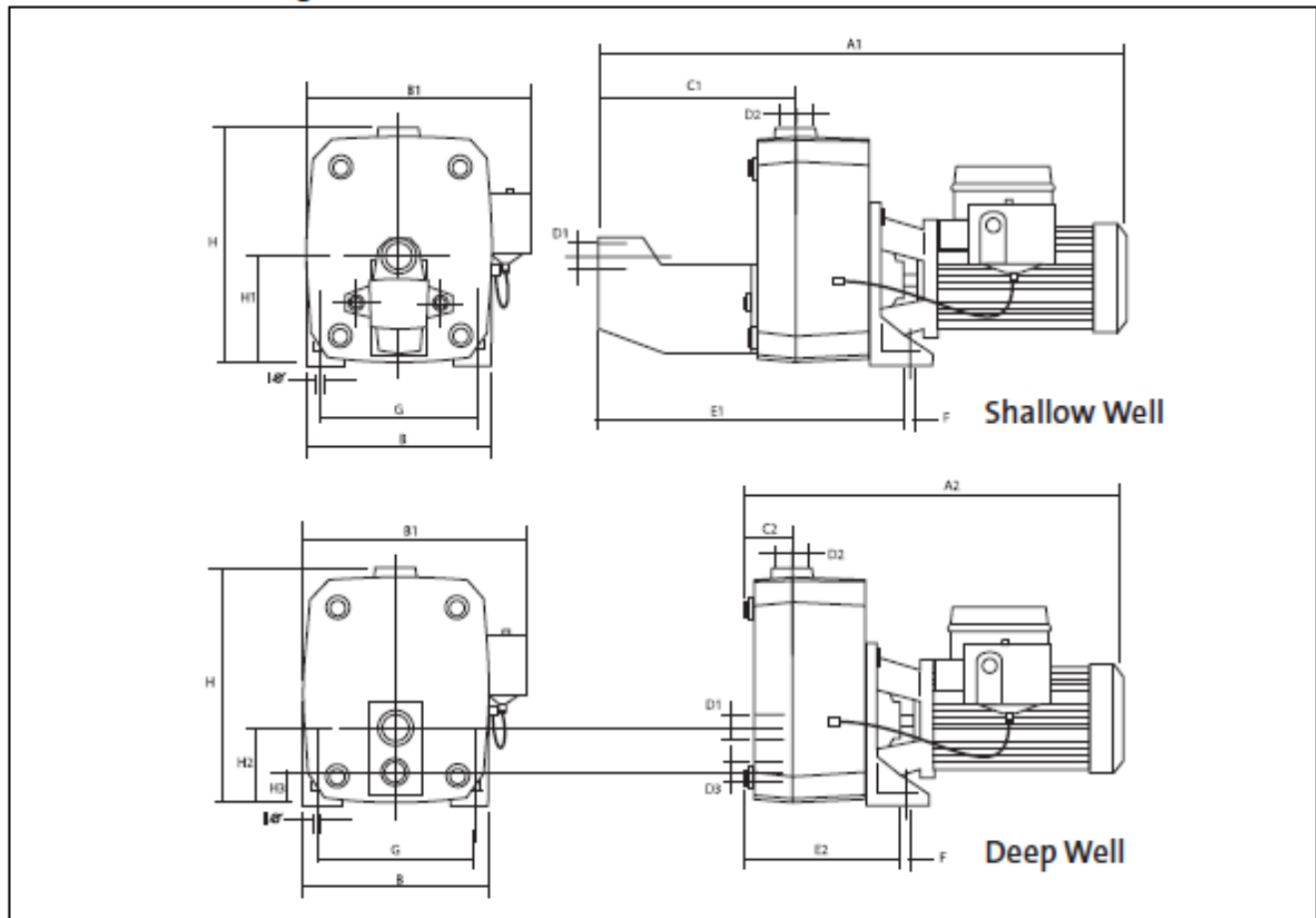
Voltage: 230 V

Current: 11 A

Available: Murray Supply



Dimensional Drawings



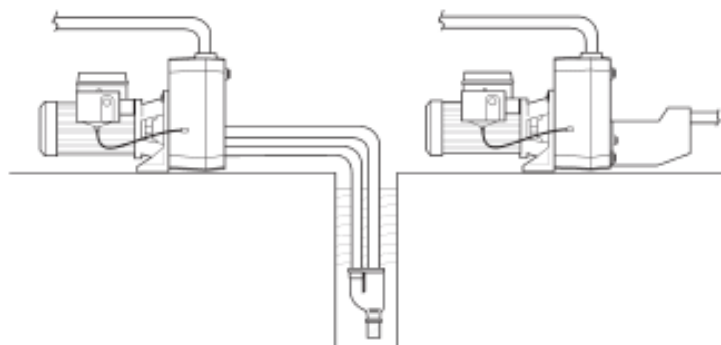
Dimensions and Weights

| Pump Type | Motor Data | | | | D1 Suction NPT | D2 Disch. NPT | D3 Return NPT | Dimensions (inches) | | | | | | | | | | | | | | Ship Wt. (lbs) | Ship Vol. (Cu Ft.) | |
|-----------|------------|------|----|-------|----------------|---------------|---------------|---------------------|------|-----|------|-----|-----|------|-----|------|-----|------|-----|-----|-----|----------------|--------------------|-----|
| | HP | S.F. | PH | Volts | | | | A1 | A2 | B | B1 | C1 | C2 | E1 | E2 | F | G | H | H1 | H2 | H3 | | | IØ |
| JPF5A | 1.5 | 1.3 | 1 | 230 | 1-1/4" | 1" | 1" | 22.0 | 15.3 | 8.3 | 11.0 | 8.7 | 2.0 | 13.8 | 7.8 | 0.78 | 5.7 | 10.0 | 6.2 | 4.3 | 2.1 | 0.44 | 70 | 1.9 |
| JPF7A | 2 | 1.2 | 1 | 230 | 1-1/4" | 1" | 1" | 25.6 | 19.9 | 8.3 | 12.4 | 8.7 | 2.0 | 13.8 | 7.8 | 0.78 | 5.7 | 10.0 | 6.2 | 4.3 | 2.1 | 0.44 | 73 | 2.5 |

Conversion Instructions from Shallow Well to DeepWell*

Remove bolts and detach ejector nose from convertible jet pump. Connect suction (D1) and pressure (D3) port to deep well ejector.

* Requires separate ejector to suit specific suction lift needs.



DIVISION 22 **PLUMBING**

MCMaster-CARR 1/2" THERMOWELLS

[RELATED SECTION 22 05 19]

Model Number: 3957K64

Location: Core Module Roof

Dimensions:

Diameter: 1/2"

Length: 4"

Finish: Brass

Features:

Fits 1/4", 5/32", 9/64" diameters

Maximum temperature: 400°F

Maximum pressure: 5,000 psi at 70°F

Available: McMaster-Carr

Price: \$22.14



Choose a Category

- Abrading & Polishing
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- Lubricating
- Material Handling
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- Power Transmission
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- Safety Supplies
- Sawing & Cutting
- Sealing
- Shipping
- Suspending

Thermowells



Quick Response



For Insulated Tanks



Heavy Duty

Use a thermowell in your tank to protect your thermometer from vibration, shock, pressure, and corrosive liquids. They also enable you to exchange thermometers without disturbing or draining the system. Thermowells have an external NPT male connection for installation in your tank or vessel and are for use with dial thermometers with a 1/2" NPT male connection.

Brass thermowells have a maximum temperature of 400° F. Maximum pressure is 5,000 psi at 70° F. **Type 304 stainless steel** and **Type 316 stainless steel** thermowells have a maximum temperature of 1650° F. Maximum pressure is 7,000 psi at 70° F. Type 304 stainless steel has good corrosion resistance. Type 316 stainless steel has excellent corrosion resistance.

Quick-response thermowells have thinner walls that allow for faster heat transfer and quicker temperature readings. **Thermowells for insulated tanks** have an extra-long nut to accommodate insulated tank walls. **Heavy duty thermowells** have thicker walls and a tapered shank to withstand high-pressure and high-flow applications.

| For Thermometer Stem Lg. | External Pipe Size | Nut Lg. (A) | Insertion Lg. (B) | Brass | Type 304 Stainless Steel | Type 316 Stainless Steel |
|---|--------------------|-------------|-------------------|----------------------|--------------------------|--------------------------|
| | | | | Each | Each | Each |
| Quick-Response Thermowells | | | | | | |
| For Thermometers with 1/4", 5/32", and 9/64" Stem Dia. | | | | | | |
| 2 1/2" | 1/2" | 1 1/16" | 1 1/8" | 3957K67 \$20.33 | 3957K68 \$23.55 | 3957K69 \$25.84 |
| 2 1/2" | 3/4" | 3/8" | 1 5/8" | 3957K77 20.33 | 3957K78 25.15 | 3957K79 31.76 |
| 4" | 1/2" | 1" | 2 1/2" | 3957K64 22.14 | 3957K65 24.39 | 3957K66 30.66 |
| <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> Catalog Page Bookmark </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> Thermowell Brass, Fits 1/4", 5/32", 9/64" Dia, 4" Stem, 1/2 Pipe Sz <input type="checkbox"/> Each </div> <div style="text-align: right; margin: 5px 0;"> <input type="button" value="ADD TO ORDER"/> </div> | | | | | | |
| In stock | | | | | | |
| 4" | 3/4" | 3/4" | 2 1/2" | 3957K11 22.50 | 3957K21 26.27 | 3957K54 33.44 |
| 4" | 1" | 3/4" | 2 1/2" | 3957K46 33.75 | 3957K47 44.07 | 3957K58 48.61 |
| 6" | 1/2" | 1" | 4 1/2" | 3957K37 29.32 | 3957K38 36.87 | 3957K51 44.43 |
| 6" | 3/4" | 3/4" | 4 1/2" | 3957K12 30.93 | 3957K22 36.79 | 3957K55 46.13 |
| 6" | 1" | 3/4" | 4 1/2" | 3957K48 45.07 | 3957K49 61.05 | 3957K59 65.90 |
| 9" | 1/2" | 1" | 7 1/2" | 3957K39 45.39 | 3957K41 59.25 | 3957K52 66.23 |
| 9" | 3/4" | 3/4" | 7 1/2" | 3957K13 45.39 | 3957K23 62.25 | 3957K56 69.06 |
| 9" | 1" | 3/4" | 7 1/2" | 3957K91 61.25 | 3957K92 82.73 | 3957K93 89.76 |
| 12" | 1/2" | 1" | 10 1/2" | 3957K42 63.04 | 3957K43 83.97 | 3957K53 99.15 |
| 12" | 3/4" | 3/4" | 10 1/2" | 3957K44 63.04 | 3957K45 85.89 | 3957K57 99.15 |
| 12" | 1" | 3/4" | 10 1/2" | 3957K94 83.02 | 3957K95 108.05 | 3957K96 118.85 |
| 18" | 1/2" | 1" | 16 1/2" | 3957K71 117.43 | 3957K72 129.39 | 3957K73 150.39 |
| 18" | 3/4" | 3/4" | 16 1/2" | 3957K84 93.93 | 3957K85 133.64 | 3957K86 150.39 |
| 24" | 3/4" | 3/4" | 22 1/2" | 3957K87 140.54 | 3957K88 176.25 | 3957K89 199.87 |

MCMaster-CARR 3/4" THERMOWELLS

[RELATED SECTION 22 05 19]

Model Number: 3957K11

Location: Main House Mechanical Closet

Dimensions:

Diameter: 3/4"

Length: 4"

Finish: Brass

Features:

Fits 1/4", 5/32", 9/64" diameters

Maximum temperature: 400°F

Maximum pressure: 5,000 psi at 70°F

Available: McMaster-Carr

Price: \$22.50



Choose a Category

- Abrading & Polishing
- Building & Grounds
- Electrical & Lighting
- Fabricating
- Fastening & Joining
- Filtering
- Flow & Level Control
- Furniture & Storage
- Hand Tools
- Hardware
- Heating & Cooling
- Lubricating
- Material Handling
- Measuring & Inspecting
- Office Supplies & Signs
- Pipe, Tubing, Hose & Fittings
- Plumbing & Janitorial
- Power Transmission
- Pressure & Temperature Control
- Pulling & Lifting
- Raw Materials
- Safety Supplies
- Sawing & Cutting
- Sealing
- Shipping
- Suspending

Optional Brass Thermowell 3960K3 Each \$35.61

Thermowells



Quick Response



For Insulated Tanks



Heavy Duty

Use a thermowell in your tank to protect your thermometer from vibration, shock, pressure, and corrosive liquids. They also enable you to exchange thermometers without disturbing or draining the system. Thermowells have an external NPT male connection for installation in your tank or vessel and are for use with dial thermometers with a 1/2" NPT male connection.

Brass thermowells have a maximum temperature of 400° F. Maximum pressure is 5,000 psi at 70° F. **Type 304 stainless steel** and **Type 316 stainless steel** thermowells have a maximum temperature of 1650° F. Maximum pressure is 7,000 psi at 70° F. Type 304 stainless steel has good corrosion resistance. Type 316 stainless steel has excellent corrosion resistance.

Quick-response thermowells have thinner walls that allow for faster heat transfer and quicker temperature readings. **Thermowells for insulated tanks** have an extra-long nut to accommodate insulated tank walls. **Heavy duty thermowells** have thicker walls and a tapered shank to withstand high-pressure and high-flow applications.

| For Thermometer Stem Lg. | External Pipe Size | Nut Lg. (A) | Insertion Lg. (B) | Brass | | | Type 304 Stainless Steel | | Type 316 Stainless Steel | |
|--|--------------------|-------------|-------------------|---------|---------|---------|--------------------------|---------|--------------------------|--|
| | | | | Each | Each | Each | Each | Each | | |
| Quick-Response Thermowells | | | | | | | | | | |
| For Thermometers with 1/4", 5/32", and 9/64" Stem Dia. | | | | | | | | | | |
| 2 1/2" | 1/2" | 1 1/16" | 1 1/8" | 3957K67 | \$20.33 | 3957K68 | \$23.55 | 3957K69 | \$25.84 | |
| 2 1/2" | 3/4" | 3/8" | 1 5/8" | 3957K77 | 20.33 | 3957K78 | 25.15 | 3957K79 | 31.76 | |
| 4" | 1/2" | 1" | 2 1/2" | 3957K64 | 22.14 | 3957K65 | 24.39 | 3957K66 | 30.66 | |
| 4" | 3/4" | 3/4" | 2 1/2" | 3957K11 | 22.50 | 3957K21 | 26.27 | 3957K54 | 33.44 | |
| <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Catalog Page Bookmark </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> Thermowell Brass, Fits 1/4", 5/32", 9/64" Dia, 4" Stem, 3/4" Pipe Sz <div style="float: right;"> <input type="checkbox"/> Each </div> <div style="text-align: right; margin-top: 5px;"> ADD TO ORDER </div> </div> | | | | | | | | | | |
| In stock | | | | | | | | | | |
| 4" | 1" | 3/4" | 2 1/2" | 3957K46 | 33.75 | 3957K47 | 44.07 | 3957K58 | 48.61 | |
| 6" | 1/2" | 1" | 4 1/2" | 3957K37 | 29.32 | 3957K38 | 36.87 | 3957K51 | 44.43 | |
| 6" | 3/4" | 3/4" | 4 1/2" | 3957K12 | 30.93 | 3957K22 | 36.79 | 3957K55 | 46.13 | |
| 6" | 1" | 3/4" | 4 1/2" | 3957K48 | 45.07 | 3957K49 | 61.05 | 3957K59 | 65.90 | |
| 9" | 1/2" | 1" | 7 1/2" | 3957K39 | 45.39 | 3957K41 | 59.25 | 3957K52 | 66.23 | |
| 9" | 3/4" | 3/4" | 7 1/2" | 3957K13 | 45.39 | 3957K23 | 62.25 | 3957K56 | 69.06 | |
| 9" | 1" | 3/4" | 7 1/2" | 3957K91 | 61.25 | 3957K92 | 82.73 | 3957K93 | 89.76 | |
| 12" | 1/2" | 1" | 10 1/2" | 3957K42 | 63.04 | 3957K43 | 83.97 | 3957K53 | 99.15 | |
| 12" | 3/4" | 3/4" | 10 1/2" | 3957K44 | 63.04 | 3957K45 | 85.89 | 3957K57 | 99.15 | |
| 12" | 1" | 3/4" | 10 1/2" | 3957K94 | 83.02 | 3957K95 | 108.05 | 3957K96 | 118.85 | |
| 18" | 1/2" | 1" | 16 1/2" | 3957K71 | 117.43 | 3957K72 | 129.39 | 3957K73 | 150.39 | |
| 18" | 3/4" | 3/4" | 16 1/2" | 3957K84 | 93.93 | 3957K85 | 133.64 | 3957K86 | 150.39 | |
| 24" | 3/4" | 3/4" | 22 1/2" | 3957K87 | 140.54 | 3957K88 | 176.25 | 3957K89 | 199.87 | |

OMEGA LOW FLOW LIQUID FLOWMETER**[RELATED SECTION 22 05 19]**

Model Number: FTB4707

Location: Main House Mechanical Closet

Dimensions:

Length: 10-1/4" [259 mm]

Width: 2-3/4" [69 mm]

Height: 1-1/2" [40 mm]

Finish: Nickel-plated brass

Features:

Maximum temperature: 185°F [85°C]

Maximum pressure: 175 psi [12 bar]

Output: Squarewave

Cable: #22 AWG 3-conductor, 12 ft [3 m]

Maximum cable run: 2000 ft [650 m]

Electrical:

Voltage: 5 to 30 Vdc

Current: 20 mA maximum

Available: Omega Engineering

Price: \$249.00



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search by: Part Number All Omega

Low Flow Liquid Flowmeters

+1 0

FTB4700 and FTB4800 Series



Low Flow Liquid Flowmeters



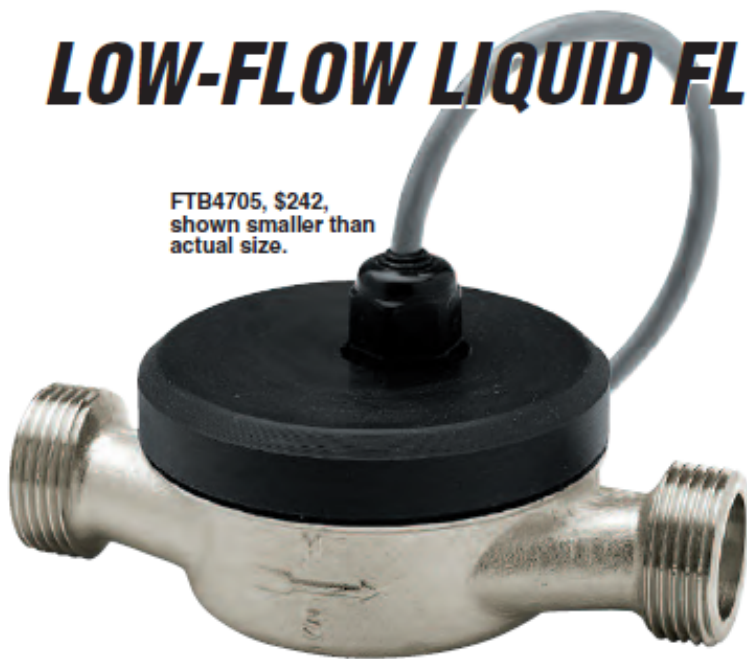
- Square Wave Output
- One Moving Part
- Rugged Nickel-Plated Brass Body or 316 Stainless Steel

[View related products - Turbine and Paddle Wheel Flowmeters](#)

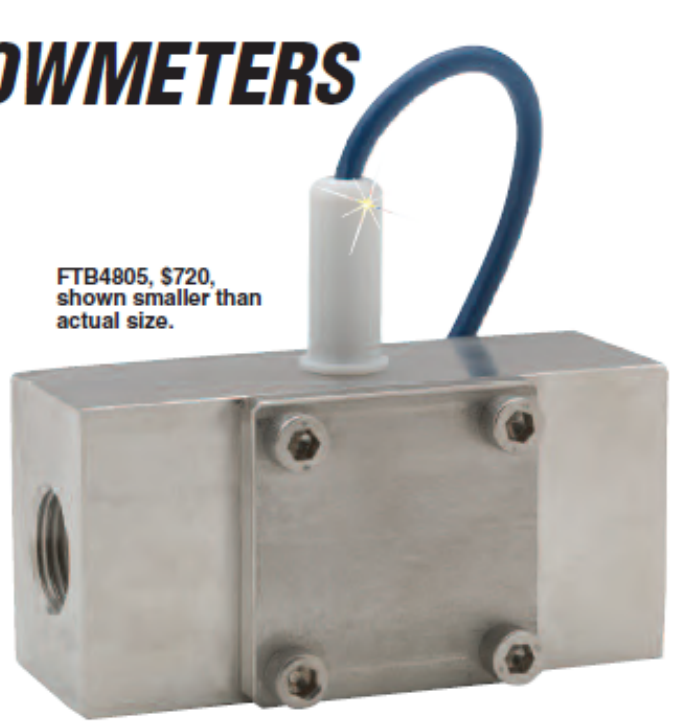
Click for [larger image](#).

| To Order (Specify Model Number) <input type="button" value="Add to Cart"/> | | | | | |
|--|--------------|----------|---|------|--|
| <input type="checkbox"/> What Other People Bought: When you see this icon, click on it to expand a list of products that other people have bought when they purchased this model. | | | | | |
| Part Number | Availability | Price | Description | RoHS | Qty. |
| Nickel-plated Brass | | | | | |
| <input type="checkbox"/> FTB4705 | In Stock | \$242.00 | 308 PPG 1/2 MNPT, 0.2 to 10 GPM | ✓ | 0 |
| <input type="checkbox"/> FTB4707 | In Stock | \$249.00 | 174 PPG 3/4 MNPT, 0.2 to 18 GPM | ✓ | 0 |
| 316SS Body | | | | | |
| <input type="checkbox"/> FTB4805 | In Stock | \$720.00 | 560 PPG 1/2 FNPT, 0.1 to 10 GPM, 316SS Body | ✓ | 0 |
| <input type="checkbox"/> FTB4807 | In Stock | \$720.00 | 380 PPG 3/4 FNPT, 0.2 to 15 GPM, 316SS Body | ✓ | 0 |
| <input type="checkbox"/> FTB4810 | In Stock | \$720.00 | 168 PPG 1 FNPT, 0.5 to 25 GPM, 316SS Body | ✓ | 0 |
| Accessories | | | | | |
| <input type="checkbox"/> DPF701 | In Stock | \$260.00 | 1/8" DIN panel meter | ? | 0 |
| | | | | | <input type="button" value="Add to Cart"/> |

LOW-FLOW LIQUID FLOWMETERS



FTB4705, \$242, shown smaller than actual size.



FTB4805, \$720, shown smaller than actual size.

FTB4700 Series Starts at

\$242



- ✓ Square-Wave Output
- ✓ One Moving Part
- ✓ Rugged, Nickel-Plated Brass Body or 316 SS

The FTB4700 Series comprises plated brass meters that are ideal for water applications, with ranges from 0.2 to 18 GPM. The FTB4800 covers a wide flow range and is housed in a rugged stainless steel package. Single-jet simplicity, combined with high-quality jewel bearings, results in long life and relatively high tolerance to harsh fluids. Typical applications include chemical batching, proportional chemical injection, fertilizer injection, proportioning of spray chemicals, and general flow rate monitoring.

The FTB4700 is available with 1/2 and 3/4" threads, with union-type meter couplings. The FTB4800 is available with 1/2, 3/4 and 1" threads. A square-wave output makes these meters ideal for many OEM control applications. This signal interfaces easily with programmable logic controllers and computer input boards. The FTB4700 or FTB4800 Series meters can be combined with the DPF701-A panel flow meter for reading flow rate or total flow, with 4 to 20 mA output.

SPECIFICATIONS

Accuracy: ±1% FS
Maximum Temperature:
 FTB4700: 85°C (185°F)
 FTB4800: 93°C (200°F)
Maximum Pressure:
 FTB4700: 12 bar (175 psi)
 FTB4800: 35 bar (500 psi)
Output: Squarewave
Power:
 FTB4700: 5 to 30 Vdc
 FTB4800: 6 to 24 Vdc
Maximum Current: 20 mA

Cable:

FTB4700: #22 AWG 3-conductor, 4 m (12')
 FTB4800: #22 AWG 3-conductor, 5.5 m (18')
Maximum Cable Run: 650 m (2000')
Maximum Pressure Drop: 15 psig

Dimensions: mm (in)

| Model No. | Overall Length | Height | Width |
|-----------|----------------|-----------|----------|
| FTB4705 | 254 (10.0) | 40 (1.56) | 69 (2.7) |
| FTB4707 | 259 (10.2) | 40 (1.56) | 69 (2.7) |
| FTB4805 | 104 (4.1) | 51 (2.0) | 51 (2.0) |
| FTB4807 | 104 (4.1) | 51 (2.0) | 51 (2.0) |
| FTB4810 | 127 (5.0) | 51 (2.0) | 51 (2.0) |

Materials

| | FTB4700 | FTB4800 |
|----------------------|----------------------------|--------------------------------|
| Body | Nickel-plated brass | 316 SS |
| Rotor Chamber | Brass | Rotor cover: 316 SS |
| Rotor | Thermoplastic | PVDF |
| Shaft | Tungsten carbide | Nickel-bonded tungsten carbide |
| Bearings | Water cooled thermoplastic | Ruby ring and ball |
| O-Ring | - | TFE-coated FKM |

MOST POPULAR MODELS HIGHLIGHTED!

To Order (Specify Model Number)

| Model No. | Price | K Factor (Pulses/Gal) | Description |
|-----------|-------|-----------------------|--------------------------------------|
| FTB4705 | \$242 | 550 | 1/2 MNPT, 0.2 to 10 GPM |
| FTB4707 | 249 | 330 | 3/4 MNPT, 0.2 to 18 GPM |
| FTB4805 | 720 | 535 | 1/2 FNPT, 0.1 to 10 GPM, 316 SS body |
| FTB4807 | 720 | 390 | 3/4 FNPT, 0.2 to 15 GPM, 316 SS body |
| FTB4810 | 720 | 220 | 1 FNPT, 0.5 to 25 GPM, 316 SS body |

Accessories

| Model No. | Price | Description |
|-----------|-------|---|
| DPF701 | \$260 | 1/8" DIN panel meter, see page M-5 for complete details |

Recommended Reference Book: Flow Measurement Methods and Applications, CM-4339, \$155, See Section Y for Additional Books

Comes complete with operator's manual.

Ordering Examples: FTB4705, 0.2 to 10 GPM, \$242.

FTB4807, 0.2 to 15 GPM, DPF701, panel meter, \$720 + 260 = \$980.



DYNAQUIP CONTROLS 3-WAY VALVE

[RELATED SECTION 22 05 23]

Model Number: EYHG4AUE20H

Location: Main House Mechanical Closet

Dimensions:

Length: 3-1/2"

Width: 4-3/4"

Height: 6-3/4"

Weight: 5.14 lbs

Finish: Brass

Features:

Electronic Actuated Ball Valve

Valve size: 3/4"

Connection: FNPT

Rated pressure: 400 psi CWP

Port: diverter L style

Number of ports: 3

Direct mount

Seats: RTFE

Electrical:

Voltage: 24 Vac, 12/24 Vdc

Available: DynaQuip

Price: \$378.75



Automated Valves

► DynaMatic Series:

Electric

- Brass 2 pc
- Bronze 3 pc
- Brass 3-Way
- Stainless 2 pc
- Stainless 3 pc
- Stainless 3-Way

► DynaMatic Series:

Pneumatic

- Brass 2 pc
- Bronze 3 pc
- Brass 3-Way
- Stainless 2 pc
- Stainless 3 pc
- Stainless 3-Way

► DynaFly Series: Electric

- 340/342 Series
- 500/522 Series
- 600/622 Series

► DynaFly Series:

Pneumatic

- 340/342 Series
- 500/522 Series
- 600/622 Series

► DRAINMASTER® Timed Automatic Drain Valve

► WaterCop®

► Actuator Accessories

- Electric
- Pneumatic

Search 

DynaMatic Series

Electric Actuator with 3-Way Brass Ball Valve NEW

The DYNAMATIC SERIES offers an excellent option for the majority of automated applications. The packaged valve and actuator unit is pre-sized and pre-assembled taking the guesswork out of sizing and assembly. The valve has a built-in platform mounting (eliminating brackets) giving a more compact assembly and true alignment. The valve has an O-ring stem seal design which keeps torque low and uniform there by extending cycle life.



Durable 3-Way Brass Ball valve has female threads and 90° Standard port diverting "L" pattern. All DynaMatic models are pre-sized for clean water, air, or light oil applications. Please call customer service for recommendations regarding dirty or severe service applications, lower airline supply pressures, or other voltage requirements.

| Downloads | File Size |
|-----------------------------------|-----------|
| ► Manual | 180 K |
| ► Repair Parts | 18 K |
| ► Technical Specs | 139 K |
| ► Catalog Sheet | 169 K |

Product Specifications and Information

MATERIALS

Electric Materials

- **Housing:** NEMA 4 rated, 4X Rated, Polyester Powder Coated Cast Aluminum
- **Gear Train:** Hardened Steel
- **Output Shaft & Override:** 416 Stainless Steel
- **Output Shaft Seals:** Buna-N
- **Lubrication:** Permanent
- **Motor:** Reversing 115VAC, 12 or 24 VAC or VDC
- **Duty Cycle:** 50% (DE) and 30% (MA)
- **Cycle Time:** 2.5-15 seconds
- **Temperature Range:** -40°F to 150°F depending upon application.

3-Way Brass Valve

- **Stem:** Nickel Plated Brass
 - **Ball:** Chrome Plated Brass
 - **Seats & Thrustwasher:** PTFE
 - **Stem Seal:** Viton® O-Ring
 - **Valve Rating:** 400 psi CWP
 - **Actuator sized for 400 psid CWP**
 - **Temperature Range:** -15°F to 300°F*
- *Dependent on Application.

FEATURES & BENEFITS

- **Compact**
- **Reliable**
- **Economical**
- **Factory Sized & Assembled**
- **One Year Warranty from Installation**
- **Add-on accessories provide these units with wide application appeal**
- **1/2" to 1 1/2" sizes can be wired in parallel**

PYHG & EYHG Series

Clean Water, Air, or Light Oil Applications

3-Way Brass Actuated Ball Valve

400 PSI CWP

The **DynaMatic Series** of actuated ball valves offers an excellent option for the majority of automated applications. The packaged valve and actuator unit is pre-sized and

pre-assembled, taking the guesswork out of sizing and assembly. ISO 5211 direct-mount platform provides accurate alignment and a compact package without the need for clumsy brackets. Designed specifically for actuation, the ball valves have O-ring seals for lower torque and longer cycle life. Pneumatic actuated models are sized for 80 PSI air pressure minimum. Electrically actuated DynaMatic valves are available with 115VAC, 220VAC, 24VAC, 24VDC, and 12VDC. All DynaMatic models are pre-sized for clean water, air, or light oil applications. *(PLEASE CALL CUSTOMER SERVICE for recommendations regarding dirty or severe service applications, lower airline supply pressures, or other voltage requirements.)*

For Electric Actuator details and options, please refer to pages 2 and 3. For Pneumatic Actuator details and accessories, please refer to pages 4 and 5.

- NPT Threaded Ends
- Chrome-Plated Brass Ball
- RTFE Seats
- Viton® Stem Seals
- PTFE Stem Packing
- 3-Way "L" Pattern
- 90° Standard Port Diverter

Standard Port
1/4"-3"



Catalog Number - Pneumatically Actuated

| Size | Double Acting | Fail-Closed | Fail-Open |
|--------|---------------|-------------|--------------|
| 1/4" | PYHG1AUD01 | PYHG1AUS024 | PYHG1AUS024F |
| 3/8" | PYHG2AUD01 | PYHG2AUS024 | PYHG2AUS024F |
| 1/2" | PYHG3AUD01 | PYHG3AUS024 | PYHG3AUS024F |
| 3/4" | PYHG4AUD01 | PYHG4AUS024 | PYHG4AUS024F |
| 1" | PYHG5AUD02 | PYHG5AUS054 | PYHG5AUS054F |
| 1 1/4" | PYHG6AUD02 | PYHG6AUS054 | PYHG6AUS054F |
| 1 1/2" | PYHG7AUD02 | PYHG7AUS054 | PYHG7AUS054F |
| 2" | PYHG8AUD05 | PYHG8AUS074 | PYHG8AUS074F |
| 2 1/2" | PYHG9AUD05 | PYHG9AUS074 | PYHG9AUS074F |
| 3" | PYHGAAUD05 | PYHGAAUS074 | PYHGAAUS074F |

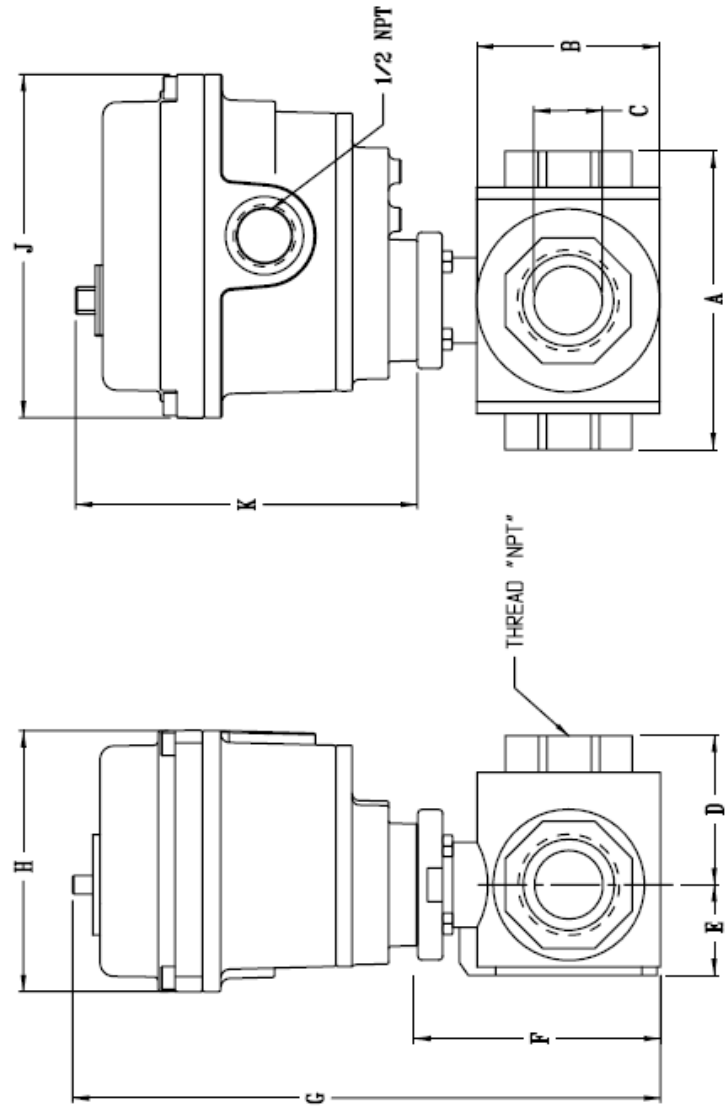
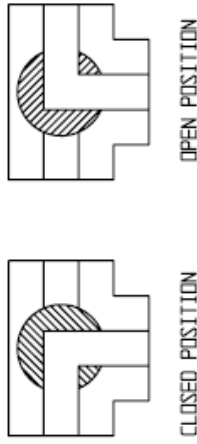
Catalog Number - Electrically Actuated

| Size | 120 VAC | Low Voltage |
|--------|---------------------------|---------------------------|
| 1/4" | EYHG1AUE20 | EYHG1AUE20H |
| 3/8" | EYHG2AUE20 | EYHG2AUE20H |
| 1/2" | EYHG3AUE20 | EYHG3AUE20H |
| 3/4" | EYHG4AUE20 ⁽¹⁾ | EYHG4AUE20H |
| 1" | EYHG5AUE25 ⁽¹⁾ | EYHG5AUE25H |
| 1 1/4" | EYHG6AUE25 ⁽¹⁾ | EYHG6AUE25H |
| 1 1/2" | EYHG7AUE25 ⁽¹⁾ | EYHG7AUE25H |
| 2" | EYHG8AUE01 ⁽²⁾ | EYHG8AUE01 ⁽²⁾ |
| 2 1/2" | EYHG9AUE01 ⁽²⁾ | EYHG9AUE01 ⁽²⁾ |
| 3" | EYHGAAUE01 ⁽²⁾ | EYHGAAUE01 ⁽²⁾ |

Options:

- ⁽¹⁾ Suffix "B" for 220 VAC, PH1
Suffix "H" for 12 to 24 VAC, PH1 and 12 to 24 VDC
- ⁽²⁾ Suffix "B" for 220 VAC, PH1
Suffix "C" for 24 VAC, PH1
Suffix "D" for 12 VDC
Suffix "E" for 24 VDC
Suffix "F" for 230 volt, PH3
Suffix "G" for 460 volt, PH3

| MODEL | EHYG1AUE20 | EHYG2AUE20 | EHYG3AUE20 | EHYG4AUE20 | EHYG5AUE25 | EHYG6AUE25 | EHYG7AUE25 | EHYG8AUF06 | EHYG9AUF06 | EYHGAUF06 |
|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| ACTUATOR | DE153 | DE153 | DE153 | DE153 | DE305 | DE305 | DE305 | AE607 | AE607 | AE607 |
| SIZE | 1/4 NPT | 3/8 NPT | 1/2 NPT | 3/4 NPT | 1 NPT | 1 1/4 NPT | 1 1/2 NPT | 2 NPT | 2 1/2 NPT | 3 NPT |
| A | 2.64 | 2.64 | 2.87 | 3.19 | 3.74 | 4.39 | 4.86 | 5.73 | 6.93 | 7.08 |
| B | 1.34 | 1.34 | 1.34 | 1.53 | 1.89 | 2.36 | 2.83 | 3.38 | 4.37 | 4.45 |
| C | .39 | .43 | .43 | .59 | .79 | .98 | 1.26 | 1.57 | 1.95 | 1.95 |
| D | 1.32 | 1.32 | 1.44 | 1.60 | 1.87 | 2.20 | 2.43 | 2.87 | 3.47 | 3.54 |
| E | .77 | .77 | .77 | .87 | 1.00 | 1.22 | 1.79 | 1.75 | 2.20 | 2.20 |
| F | 1.87 | 1.87 | 1.87 | 2.06 | 2.58 | 3.03 | 3.76 | 4.59 | 5.54 | 5.58 |
| G | 6.59 | 6.59 | 6.59 | 6.78 | 7.95 | 8.40 | 9.13 | 11.71 | 12.66 | 12.70 |
| H | 3.58 | 3.58 | 3.58 | 3.58 | 3.58 | 3.58 | 3.58 | 7.00 | 7.00 | 7.00 |
| J | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 | 4.75 | 7.00 | 7.00 | 7.00 |
| K | 4.72 | 4.72 | 4.72 | 4.72 | 5.37 | 5.37 | 5.37 | 7.12 | 7.12 | 7.12 |
| WT. LBS | 4.92 | 4.86 | 4.91 | 5.14 | 6.54 | 8.05 | 9.92 | 21.58 | 28.83 | 32.05 |



3-WAY L-PORT BRASS BALL VALVE
 ISO 5211 MOUNTING PAD
 PRESSURE RATING; 400 WOG - 100 WSP

| VALVE DATA | |
|---------------|---------------------|
| BODY/END CAP | BRASS |
| STEM | BRASS, NI PL |
| BALL | BRASS, NI-CHROME PL |
| SEATS | PTFE |
| THRUST WASHER | PTFE |
| STEM SEAL | VITON O-RINGS |

UNCONTROLLED NO. VYH SERIES FILE NO. SUB138.1

DRAWING 3-WAY L-PORT BALL VALVE
ELECTRIC ACTUATOR

| REV | DATE | CH'GD | DATE | BY | DATE |
|--------|----------|--------|----------|--------|----------|
| L.J.H. | 05-26-05 | L.J.H. | 05-26-05 | L.J.H. | 05-26-05 |

DynaQuip Controls

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WATTS 3/4" SWEAT MIXING VALVE**[RELATED SECTION 22 05 23]**

Model Number: 1170-US-M2

Location: Main House Mechanical Closet

Dimensions:

Weight: 1.6 lbs [.73 kg]

Finish: Bronze

Features:

Hot inlet temperature: 120°F - 200°F [49°C - 93°C]

Cold inlet temperature: 40°F - 85°F [4°C - 29°C]

Temperature out: 90°F - 160°F [32°C - 71°C]

Maximum temperature: 200°F [93°C]

Maximum pressure: 150 psi [10.34 kPa]

Minimum supply pressure: 30 psi [207 kPa]

Maximum pressure differential between hot and cold water supplies: 25%

Available: Murray Supply



For Residential, Commercial and Institutional Applications

Job Name _____

Contractor _____

Job Location _____

Approval _____

Engineer _____

Contractor's P.O. No. _____

Approval _____

Representative _____

Series 1170 and L1170

Hot Water Temperature Control Valves

Sizes: ½" – 1" (15 – 25mm)

Series 1170, L1170 Hot Water Temperature Control Valves are specifically designed for mixing hot and cold water on hot water supply systems. They can be used for a variety of applications to reduce the temperature of the hot water from the system, and are ideal for radiant heat applications. This series features a "double throttling" design which combines the control of the hot and cold water to provide a sensitive response to changes in water temperature passing through the mixing chamber.

The 1170-M2 can be set to any temperature between 90°F and 160°F (60°F and 120°F for model L1170-M2) with flow rates as low as 0.5 gpm and as high as 23 gpm (refer to capacity chart on the back). The superior flow characteristics of this valve provide accurate temperature control to the requirements of ASSE 1017* across the rated flow range.

These valves also provide additional safety as they restrict mixed water out to a drip upon loss of cold water supply to the valve.

As an added feature, the 1170-M2 and L1170-M2 incorporate integral check valves and filter washers in both the hot and cold water inlets to protect against cross flow. Available with threaded (-UT), solder (-US), PEX, (-QC) Quick-Connect or CPVC connections.

Features

- Bronze body construction
- Solid wax hydraulic principle thermostat assures dependable mixing of hot and cold water
- Thermostat controls both hot and cold water
- Models available with solder, thread, PEX, Quick-Connect or CPVC end connections
- Integral filter washers and check valves
- Adjustment cap with locking feature
- ASSE 1017 listed*

Specifications

A Hot Water Temperature Control Valve shall be installed on water heating equipment to provide tempered water to supply piping. Valve shall have a bronze body, include integral check valves and operate so the thermostat controls the cold and hot water ports. The valve shall be provided with solder (-US), threaded (-UT), PEX, (-QC) Quick-Connect or CPVC connections. Valve shall be ASSE Standard 1017* Listed. Valve shall be a Watts Regulator Company 1170-M2 or L1170-M2.

*ASSE 1017 listing is for valves used in hot water source applications.



1170-US-M2



1170-QC-M2

ASSE Standard 1017 Listed*

Minimum flow requirements to maintain set temperature for Series 1170-M2

| VALVE SIZE | GPM |
|------------|-----|
| ½" – 1" | .5 |

↑WARNING

Watts Hot Water Temperature Control Valve Series 1170 are designed to be installed at or near the boiler or water heater. They cannot be used by themselves for tempering water temperatures at fixtures where ASSE Standard 1016 or ASSE Standard 1070 listed devices are required. To comply with ASSE Standard 1016 or ASSE Standard 1070, listed devices such as Watts Series L111, USG or MMV should be used at fixtures to prevent possible injury.

Watts Hot Water Temperature Control Valve Series 1170 are not designed to compensate for system pressure fluctuations. Such use may result in severe bodily injury (i. e. scalding or chilling) and/or death.

When installing the Series 1170 valves in radiant heat applications, the components of the radiant heat system must be of materials with a construction capable of withstanding the high limit output temperatures of the heating boiler. If you are uncertain as to the product's adaptability for your application, please consult an authorized representative before installing or using the product.

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

Material

| | |
|----------------------|-----------------|
| Body: | Bronze |
| Springs: | Stainless steel |
| Thermostat Assembly: | Copper |
| O-Rings: | EPDM |
| Pistons: | Udel-P1700 |

Pressure — Temperature

Minimum Supply Pressure (Static): 30psi (207 kPa)

Inlet Temperatures: hot inlet, 120°F – 200°F (49°C – 93°C),
cold inlet, 40°F – 85°F (4°C – 29°C)

Hot Water Inlet to Outlet Temperature Differential: 5°F (3°C)
above set point

1170-M2 Temperature Out: Field range: 90°F – 160°F (32°C – 71°C),
adjustable: Accurate within ±3°F (1.7°C)

L1170-M2 Temperature Out: Field range: 60°F – 120°F (16°C – 49°C),
adjustable: Accurate within ±3°F (1.7°C)

Maximum Temperature: 200°F (93°C)

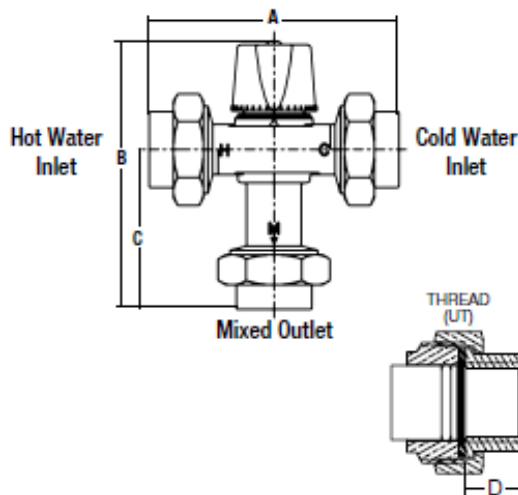
Maximum Pressure: 150psi (10.34 kPa)



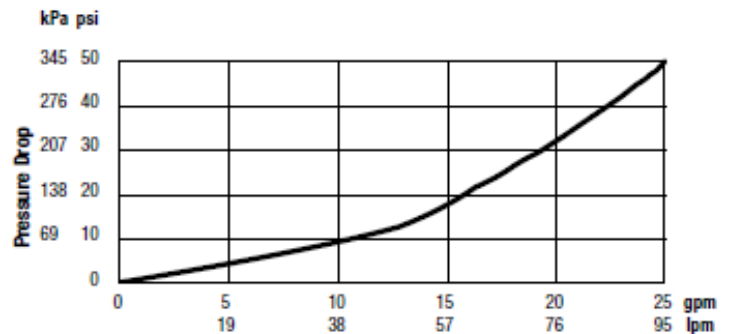
Maximum Pressure Differential Between Hot and Cold Water Supplies: 25%

Approval: CSA B125 certified
Listing: ASSE 1017, IAPMO, UPC

Dimensions — Weights



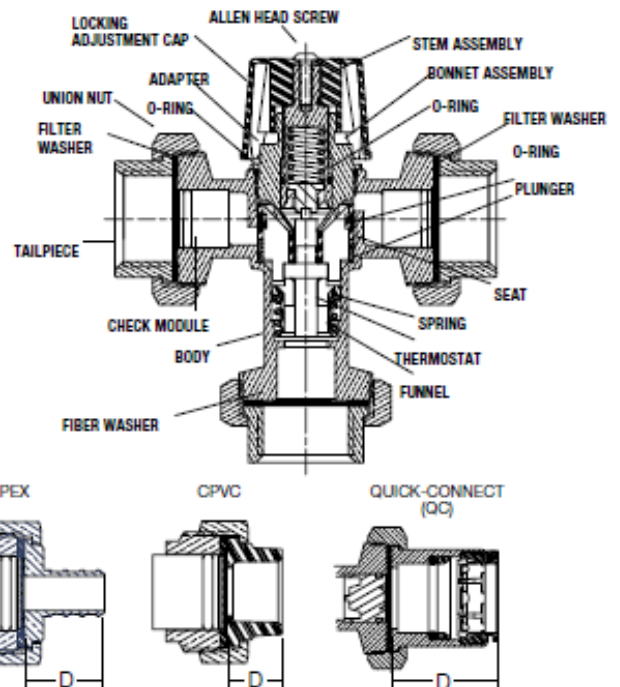
Capacity*



Flow

Flow curves are for reference. Actual flows may vary depending on system temperatures and/or pressures.
*Flow curve with integral inlet filters check valves

Basic Construction



| SIZE (DN) | | MODEL | A | | B | | C | | D | | WEIGHT | |
|-----------|-----|--------------|---------|-----|---------|-----|--------|-----|---------|-----|--------|------|
| in. | mm. | | in. | mm. | in. | mm. | in. | mm. | in. | mm. | lbs. | kg. |
| 1/2 | 15 | 1170-UT-M2 | 4 7/8 | 124 | 5 7/16 | 137 | 3 9/16 | 80 | 1/2 | 13 | 1.5 | .68 |
| 3/4 | 20 | | 4 7/8 | 124 | 5 7/16 | 137 | 3 9/16 | 80 | 9/16 | 14 | 1.6 | .73 |
| 1 | 25 | | 5 7/16 | 135 | 5 7/8 | 143 | 3 9/16 | 86 | 11/16 | 17 | 1.6 | .73 |
| 1/2 | 15 | 1170-US-M2 | 4 13/16 | 123 | 5 3/8 | 137 | 3 1/8 | 80 | 1/2 | 14 | 1.5 | .68 |
| 3/4 | 20 | | 5 5/16 | 135 | 5 5/8 | 143 | 3 5/8 | 86 | 3/4 | 19 | 1.6 | .73 |
| 1 | 25 | | 5 13/16 | 148 | 5 7/8 | 149 | 3 5/8 | 92 | 15/16 | 24 | 1.6 | .73 |
| 1/2 | 15 | 1170-PEX-M2 | 5 1/4 | 133 | 5 9/16 | 142 | 3 5/16 | 85 | 5/8 | 16 | 1.5 | .68 |
| 3/4 | 20 | | 5 1/2 | 140 | 5 11/16 | 145 | 3 7/16 | 88 | 5/8 | 16 | 1.6 | .73 |
| 1 | 25 | | 5 7/8 | 149 | 5 7/8 | 150 | 3 5/8 | 93 | 13/16 | 21 | 1.6 | .73 |
| 1/2 | 15 | 1170-CPVC-M2 | 4 3/4 | 121 | 5 5/16 | 136 | 3 1/16 | 79 | 1/2 | 13 | 1.5 | .68 |
| 3/4 | 20 | | 5 1/4 | 133 | 5 9/16 | 142 | 3 5/16 | 85 | 3/4 | 19 | 1.6 | .73 |
| 1 | 25 | | 5 13/16 | 144 | 5 13/16 | 147 | 3 9/16 | 90 | 15/16 | 24 | 1.6 | .73 |
| 1/2 | 15 | 1170-QC-M2 | 6 5/8 | 168 | 6 1/4 | 159 | 4 | 102 | 1 1/2 | 38 | 2.17 | .98 |
| 3/4 | 20 | | 6 15/16 | 177 | 6 7/16 | 163 | 4 3/16 | 106 | 1 11/16 | 42 | 2.88 | 1.31 |
| 1 | 25 | | 7 1/8 | 181 | 6 1/2 | 165 | 4 1/4 | 108 | 1 3/4 | 44 | 3.65 | 1.66 |



A Watts Water Technologies Company



ISO 9001-2000
CERTIFIED

USA: 815 Chestnut St., No. Andover, MA 01845-6098; www.watts.com

Canada: 5435 North Service Rd., Burlington, ONT. L7L 5H7; www.wattscanada.ca

CASH ACME HEATGUARD 3/4" SWEAT MIXING VALVE

[RELATED SECTION 22 05 23]

Model Number: 110-DLF

Location: Main House Mechanical Closet

Finish: Bronze

Features:

Flow rate: 1.0 gpm - 20 gpm

Hot inlet temperature: 195°F maximum [90°C]

Cold inlet temperature: 39°F - 80°F [5°C - 27°C]

Temperature out: 90°F - 130°F [32°C - 54°C]

Maximum pressure: 145 psi [1000 kPa]

Available: Alternative Heating & Supplies

Price: \$85.65





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CASH ACME HEAT GUARD 110-D TEMPERING VALVE, SWEAT





Part Number: MVS

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Availability: **In stock**

Manufacturer: **Cash Acme**
Material: **Brass**
Installation Type: **Copper Sweat**
Warranty: **1 Year Warranty**

| Options | Product Name | Price | Qty |
|---|--|-----------------------|--------------------------------|
|  | Cash Acme Heat Guard 110-D Tempering Valve, 3/4" sweat | Price: \$85.65 | <input type="text" value="0"/> |
|  | Cash Acme Heat Guard 110-D Tempering Valve, 1" sweat | Price: \$89.93 | <input type="text" value="0"/> |

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- DESCRIPTION
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- OVERVIEW
- SHIPPING
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Heatguard® 110-D Thermostatic Mixing Valve

Delivers water at a safe 120°F (49°C) or lower from all outlets, while allowing the heater to be set at a germ-killing 140°F (60°C) or higher which aids in preventing the growth of legionella bacteria in the water heater. The higher tank temperature means that hot water demands can be satisfied longer. Robust, low complexity construction. Every valve is tested for performance prior to shipping. Unique purpose designed adjuster tool minimizes unauthorized tampering with valve setting.

Approvals:

The Heatguard® 110-D is certified to ASSE 1017 and CSA B125.3 and is listed by ASSE and IAPMO.

AMERICAN VALVE 1" BALL VALVE

[RELATED SECTION 22 05 23]

Model Number: M100S 1

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: sweat

Available: Lowes

Price: \$15.54





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Home : [Search "m100s"](#) : AMERICAN VALVE 1" Quarter Turn Brass Ball Valve



AMERICAN VALVE 1" Quarter Turn Brass Ball Valve

Item #: 62197 | Model #:M100S 1

★★★★★ Be the first to write a review!

\$15.54

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AMERICAN VALVE 1" Full Port Threaded Ball...

Not Yet Rated

\$15.51



AMERICAN VALVE 1/2" Brass Ball Valve

★★★★★

\$12.36



Harbor Breeze 52" Armitage White Ceiling Fan

★★★★★

\$34.97



The Hillman Group 48-Count #6 Zinc-Plated...

Not Yet Rated

\$1.26



Keeney Mfg. Co. (1) One-Hole Face Plate with...

Not Yet Rated

\$4.43

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Type

Ball valve

Turn

Quarter turn

Inlet Thread Type

Sweat

With Waste

No

Frost Proof

No

Material

Brass

AMERICAN VALVE 3/4" BALL VALVE

[RELATED SECTION 22 05 23]

Model Number: T200W 3/4

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: female

Available: Lowes

Price: \$13.76





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AMERICAN VALVE 3/4" Brass Ball Valve

Item #: 84380 | Model #: T200W 3/4

★★★★★ Be the first to write a review!

\$13.76

Customers Also Viewed



AMERICAN VALVE 3/4" Quarter Turn Brass Ball...

Not Yet Rated

\$13.80



AMERICAN VALVE 3/4" Quarter Turn Bronze...

Not Yet Rated

\$19.92



AMERICAN VALVE 3/4" Full Port Ball Valve

Not Yet Rated

\$9.87



AMERICAN VALVE 3/4" Full Port Ball Valve

Not Yet Rated

\$9.87



AMERICAN VALVE 1/2" Brass Ball Valve

★★★★★

\$12.36

[Description](#)

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[Q&A](#)

Type

Ball valve

Turn

Quarter turn

Inlet Thread Type

Female

With Waste

Yes

Frost Proof

No

Material

Brass

AMERICAN VALVE 3/4" FULL PORT BALL VALVE

[RELATED SECTION 22 05 23]

Model Number: M100S 3/4

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: sweat

Available: Lowes

Price: \$9.87





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AMERICAN VALVE 3/4" Full Port Ball Valve

Item #: 99620 | Model #:M100S 3/4

★★★★★ [Be the first to write a review!](#)

\$9.87

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AMERICAN VALVE 3/4" Quarter Turn Brass Ball...

Not Yet Rated

\$13.80



Wrot Pressure Close Rough 90-Degree Elbow ...

Not Yet Rated

\$1.10



Wrot Pressure Adapter 3/4" C X 3/4" Mip

Not Yet Rated

\$2.00



AMERICAN VALVE 3/4" Full Port Ball Valve

Not Yet Rated

\$9.87



AMERICAN VALVE 3/4" Quarter Turn Bronze...

Not Yet Rated

\$19.92

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Type

Ball valve

Turn

Quarter turn

Inlet Thread Type

Sweat

With Waste

No

Frost Proof

No

Material

Brass

AMERICAN VALVE 1" FULL PORT BALL VALVE

[RELATED SECTION 22 05 23]

Model Number: M100 1

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: female

Available: Lowes

Price: \$15.51





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AMERICAN VALVE 1" Full Port Threaded Ball Valve

Item #: 101417 | Model #:M100 1

★★★★★ Be the first to write a review!

\$15.51

Customers Also Viewed



AMERICAN VALVE 1" Quarter Turn Brass Ball...

Not Yet Rated

\$15.54



AMERICAN VALVE 3/4" Quarter Turn Bronze...

Not Yet Rated

\$19.92



AMERICAN VALVE 1" PVC In-Line Check Socket...

Not Yet Rated

\$8.95



ProPlumber 40/60 Pressure Switch

Not Yet Rated

\$23.54



AMERICAN VALVE 1/2" Brass Ball Valve

Not Yet Rated

\$8.89

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Type

Ball valve

Turn

Quarter turn

Inlet Thread Type

Female

With Waste

No

Frost Proof

No

Material

Brass

VANGUARD 3/4" X 3/4" BALL VALVE

[RELATED SECTION 22 05 23]

Model Number: PXV3434

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: crimp

Outlet thread type: crimp

Minimum working temperature: 35°F

Maximum working temperature: 200°F

Available: Lowes

Price: \$9.79



Home : Search "vanguard ball valve" : Vanguard 3/4" x 3/4" Brass Ball Valve



Vanguard 3/4" x 3/4" Brass Ball Valve

Item #: 148206 | Model #: PXV3434

★★★★★ Be the first to write a review!

\$9.79

Customers Also Viewed



Vanguard 3/4" PEX Copper Crimp Rings

Not Yet Rated

\$6.20



Vanguard 3/4" Crimp Tee

Not Yet Rated

\$2.49



Vanguard 18" PEX Water Flex Connector

Not Yet Rated



Vanguard 1/2" x 1/2" Brass Ball Valve

Not Yet Rated

\$5.96



Vanguard 1/2" PEX Copper Crimp Rings

★★★★★

\$15.49

Description Specifications Info & Guides Reviews Q&A

| | | | |
|-----------------------------------|-----------------|--------------------|-------|
| Type | Valve | Size - Diameter | 3/4" |
| Common Uses | PEX fittings | Inlet Thread Type | Crimp |
| Code Approvals | NSF, ASTM F1807 | Outlet Thread Type | Crimp |
| Min Working Temperature (Degrees) | 35.0 | Material | Brass |
| Max Working Temperature (Degrees) | 200.0 | Turn | 1/4" |
| Sub Type | Ball valve | NSF Safety Listing | Yes |
| Degree of Angle | N/A | | |

AMERICAN VALVE 1-1/2" CHECK VALVE

[RELATED SECTION 22 05 23]

Model Number: M31 1-1/2

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: female

Available: Lowes

Price: \$22.92





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AMERICAN VALVE 1 1/2" Brass Check Valve IPS

Item #: 103752 | Model #:M31 1 1/2

★★★★★ Be the first to write a review!

\$22.92

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ProPlumber 1-1/4" Brass Check Valve
Not Yet Rated
\$19.70



AMERICAN VALVE 2" PVC Check Valve Socket
Not Yet Rated
\$12.28



AMERICAN VALVE 1 1/2" Brass Check Valve IPS
Not Yet Rated
\$22.92



ProPlumber 2" Sewage Pump Check Valve
Not Yet Rated
\$19.97



ProPlumber 1" Check Valve
Not Yet Rated
\$17.32

Description

Specifications

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Reviews

Q&A

Type

Check valve

Turn
With Waste

N/A
No

Inlet Thread Type

Female

Material

Brass

Frost Proof

No

AMERICAN VALVE 1" CHECK VALVE

[RELATED SECTION 22 05 23]

Model Number: M31 1

Finish: Brass

Features:

Turn: quarter turn

Inlet thread type: female

Available: Lowes

Price: \$13.28





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AMERICAN VALVE 1" Brass Check Valve

Item #: 27947 | Model #:M31 1

★★★★★ Be the first to write a review!

\$13.28

Customers Also Viewed



AMERICAN VALVE 1" Brass Check Valve

Not Yet Rated

\$13.28



AMERICAN VALVE 1" PVC In-Line Check Socket...

Not Yet Rated

\$8.95



ProPlumber 1" Check Valve

Not Yet Rated

\$17.32



AMERICAN VALVE 1" Brass Spring Loaded Check...

Not Yet Rated

\$15.95



AMERICAN VALVE 1" Brass Spring Loaded Check...

Not Yet Rated

\$15.95

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Type

Check valve

Turn
With Waste

N/A
No

Inlet Thread Type

Female

Material

Brass

Frost Proof

No

AMERICAN WATER HEATER TEMPERATURE AND PRESSURE VALVE

[RELATED SECTION 22 05 23]

Model Number: 6900829

Finish: Brass

Features:

3" cavity

Available: Lowes

Price: \$11.79





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American Water Heater® Temperature and Pressure Valve

Item #: 31772 | Model #:6900829

★★★★★ [Be the first to write a review!](#)

\$11.79

Customers Also Viewed



American Water Heater® Temperature and...

Not Yet Rated

\$12.97



ProPlumber 1/2" Pressure Relief Valve

Not Yet Rated

\$11.38



Whirlpool Water Heater Replacement Drain...

★★★★★

\$3.98



Watts 3/4" Bronze Water Pressure Reducing...

Not Yet Rated

\$27.80



Whirlpool 40-Gallon 6-Year Electric Water...

★★★★★

\$226.00

[Description](#)

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Temperature and Pressure Valve

- Replacement temperature and pressure valve
- 3" cavity

CHARLOTTE PIPE 3" PVC DWV CLEANOUT PLUG

[RELATED SECTION 22 05 76]

Model Number: PVC 00106 1000

Dimensions:

Diameter: 3" [76 mm]

Features:

Type: plug

Inlet thread type: male

Minimum working temperature: 32°F

Maximum working temperature: 140°F

Available: Lowes

Price: \$1.76





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Home : Search "pvc 00106 " : Charlotte Pipe 3" PVC DWV Cleanout Plug



Charlotte Pipe 3" PVC DWV Cleanout Plug

Item #: 23307 | Model #:PVC 00106 1000

★★★★★ Be the first to write a review!

\$1.76

- Description
- Specifications
- Info & Guides
- Reviews
- Q&A

| | | | |
|-----------------------------------|---------------|--------------------|------------------------------------|
| Type | Plug | Size - Diameter | 3" |
| Code Approvals | ASTM D 1784; | Inlet Thread Type | Male |
| | ASTM D 2665; | Outlet Thread Type | N/A |
| | ASTM D 3311 | NSF Safety Listing | Yes |
| Min Working Temperature (Degrees) | 32.0 | Common Uses | Drain, Waste and Vent Applications |
| Max Working Temperature (Degrees) | 140.0 | | |
| Sub Type | Cleanout plug | | |
| Degree of Angle | N/A | | |

CHARLOTTE PIPE 3" DWV FEMALE ADAPTER

[RELATED SECTION 22 05 76]

Model Number: PVC 00101 1200

Dimensions:

Diameter: 3" [76 mm]

Features:

Type: adapter

Inlet thread type: female

Outlet thread type: hub

Minimum working temperature: 32°F

Maximum working temperature: 140°F

Available: Lowes

Price: \$3.94





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Home : Search "pvc 00101 1200" : Charlotte Pipe 3" PVC DWV Female Adapter



Charlotte Pipe 3" PVC DWV Female Adapter

Item #: 23287 | Model #:PVC 00101 1200

★★★★★ Be the first to [write a review!](#)

\$3.94

Customers Also Viewed



Charlotte Pipe 3" PVC DWV Cleanout Plug

Not Yet Rated

\$1.76



Charlotte Pipe 3" PVC DWV Coupling

Not Yet Rated

\$1.30



Charlotte Pipe 3" PVC DWV Fitting Cleanout...

Not Yet Rated

\$3.37



Charlotte Pipe 3" PVC DWV Male Adapter

Not Yet Rated

\$3.69



Charlotte Pipe 3" PVC 90° Elbow

Not Yet Rated

\$2.50

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Size - Diameter

3"

Degree of Angle

N/A

Type

Adapter

Size - Diameter

3

Code Approvals

ASTM D 1784;
ASTM D 2665;
ASTM D 3311

Inlet Thread Type

Female

Outlet Thread Type

Hub

NSF Safety Listing

Yes

Common Uses

Drain,
Waste and
Vent
Applications

Min Working Temperature (Degrees)

32.0

Max Working Temperature (Degrees)

140.0

Sub Type

Adapter

CHARLOTTE PIPE 3" PVC DWV WYE

[RELATED SECTION 22 05 76]

Model Number: PVC 00602 1000

Dimensions:

Diameter: 3" [76 mm]

Features:

Type: wye

Inlet thread type: spigot

Outlet thread type: hub

Minimum working temperature: 32°F

Maximum working temperature: 140°F

Available: Lowes

Price: \$10.03





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Home : Search "pvc 00602 1000" : [Charlotte Pipe 3" PVC DWV Wye](#)



Charlotte Pipe 3" PVC DWV Wye

Item #: 89255 | Model #:PVC 00602 1000

★★★★★ Be the first to [write a review!](#)

\$10.03

Customers Also Viewed



Charlotte Pipe 3" x 10' PVC DMV Schedule 40...

Not Yet Rated

\$10.40



Charlotte Pipe 2" x 10' PVC Schedule 40 Pipe

Not Yet Rated

\$7.00



Charlotte Pipe 2" PVC P-Trap with Solvent...

Not Yet Rated

\$3.70



Charlotte Pipe PVC DWV Wye

Not Yet Rated

\$5.36



NDS 3" 45° Elbow

Not Yet Rated

\$2.62

[Description](#)

[Specifications](#)

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[Q&A](#)

Type

Wye

Schedule 30

No

Code Approvals

ASTM D-1784, ASTM D-2665, ASTM D-3311

Size - Diameter

3"

Inlet Thread Type

Spigot

Outlet Thread Type

Hub

NSF Safety Listing

Yes

Min Working Temperature (Degrees)

32.0

Max Working Temperature (Degrees)

140.0

Common Uses

Drain, Waste and Vent

Sub Type

Wye

Degree of Angle

45

VIEGA PUREFLOW MANIFOLD 14 PORT

[RELATED SECTION 22 11 13]

Model Number: MANABLOC

Location: Main House Mechanical Closet

Dimensions:

Length: 15-15/16" [406 mm]

Width: 8" [203 mm]

Height: 3" [76 mm]

Features:

Total ports: 14

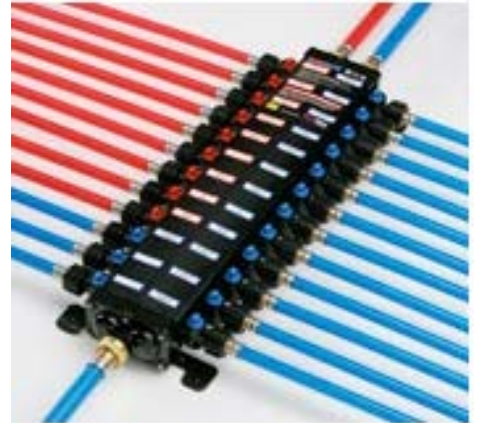
Port size: 1/2"

Main waterway: 1-1/4" [31.8 mm]

Flow rate: 4 gpm

Pressure drop: 3.4 drop

Available: Murray Supply





PureFlow® MANABLOC® Manifold Control Unit For ViegaPEX™, ViegaPEX™ Ultra and FostaPEX® SDR-9 Cross-linked Polyethylene (PEX)

Scope

This specification designates requirements for the PureFlow MANABLOC Manifold Plumbing Control Unit. The MANABLOC parallel water distribution system supplies water to individual plumbing fixtures through dedicated ports and distribution lines. Each port (outlet) is equipped with a built-in shut-off valve to provide control for each fixture from a central location. The MANABLOC has separate hot and cold water inlets and ports to manage the entire plumbing system. A variety of fitting options are available for the MANABLOC distribution ports, including PEX Compression, Bronze PEX Press, Brass PEX Crimp and PolyAlloy PEX Crimp fittings. These distribution connections come complete with the MANABLOC when ordered. However, supply connections and fixture transition fittings are not included with the unit but are available separately.

Materials

The modular MANABLOC sections are molded from polysulfone (PLS) plastic. This material is used extensively in the medical industry and is highly resistant to hot water, chlorine and other chemicals typically found in potable water systems. The other components making up the MANABLOC consist of corrosion-resistant metals and engineered plastics that have been chosen specifically for each purpose. The stiffener used in the compression port fitting assembly is manufactured from 304 stainless steel.

Marking and Certification

MANABLOC units are marked with the product name, unit part number, material designation, production date and marks of third-party certifications by NSF International (NSF-pw) to ASTM F877 and ANSI/NSF standards 14 and 61, CSA B137.5 Warnock Hersey, and are listed with IAPMO as meeting the requirements of the Uniform Plumbing Code.

Recommended Uses

The MANABLOC is recommended for use in hot and cold potable water distribution systems in single and multifamily dwellings, as well as multiple-unit structures (apartments, condos, hotels, motels, etc.). Maximum pressure/temperature rating is 100 psi @ 180°F. The MANABLOC is not to be used directly in line with hot water domestic recirculation loops. PureFlow MANABLOC system components are not interchangeable with components and tubing from other suppliers. For information on other hot and cold applications not listed here, consult with your Viega representative.

Handling and Installation

The MANABLOC must be protected from UV exposure and petroleum products that can damage them. Use of these materials in hot and cold water distribution systems must be in accordance with good plumbing practices, applicable code requirements, and current installation practices available from Viega. Contact a Viega representative or the applicable code enforcement bureau for information about approvals for specific applications.

Capacities and K-Factor

| Specifications | English Units | SI |
|---|---------------------------|---------------------------------|
| Main Waterway (each side) | 1-1/4" | 31.8mm |
| Main Inlet/Outlet Connection | 1" Male NPSM | - |
| Fixture Ports | 3/8" CTS and 1/2" CTS | 9.5mm and 12.7mm |
| Fixture Port Rating (each) | 3/8" - 2.5 GPM | 3/8" - 9.5 LPM |
| (@ 8 FPS tubing velocity) | 1/2" - 4 GPM | 1/2" - 15.1 LPM |
| Fixture Port K-Factor | 3/8" - .35 | 3/8" - 1.66 x 10 ⁻³ |
| | 1/2" - .21 | 1/2" - 9.997 x 10 ⁻⁴ |
| | (PSI=KxGPM ²) | (BAR=KxLPM ²) |
| Main Bore Flow Capacity (each side) (2006 IPC Table 604.10.1) | 31 GPM | 117.3 LPM |
| Main Bore Through Feed K Factor | 0.012 | 56.98x10 ⁻⁶ |
| (36 Ports with "Y" Block) | (PSI=KxGPM ²) | (BAR=KxLPM ²) |
| WSFU Capacity (each side) (2006 IPC, table E103.3) | 60 | - |



VIEGA
301 N. Main, 9th Floor
Wichita, KS 67202
Phone: 1-800-976-9819
Fax: 1-800-976-9817

service@viega.com
www.viega.com



TechData

PRODUCT SPECIFICATION SHEET



Quality Assurance

When the product is marked with the ASTM F877 designation, it affirms that all MANABLOC manifold control units are factory-assembled and pretested prior to delivery to the field. Viega utilizes protective packaging to reduce risk of damage during shipping and storage. MANABLOC manifolds are not intended to be fabricated or disassembled in the field. MANABLOC manifolds are intended for potable water use only.

Certification

NSF-pw - NSF International Performance and Health Effects (Standards 14 & 61)

UPC - IAPMO Certified

Intertek Testing Services (Warnock Hersey) - certification to CSA B137.5

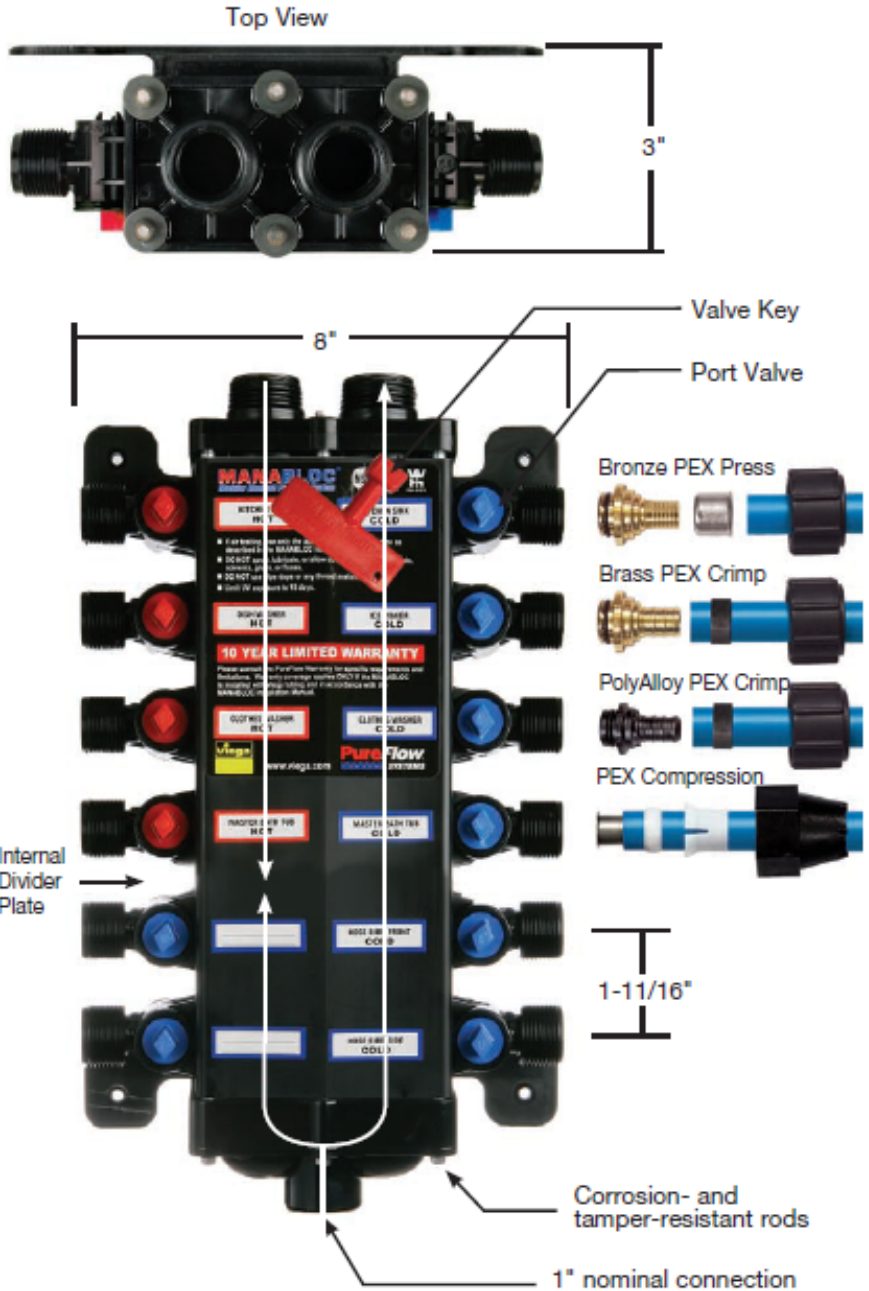
MANABLOC Dimensions

| Total Ports | Length |
|-------------|-------------|
| 14 | 15 - 15/16" |
| 18 | 19 - 3/8" |
| 24 | 24 - 3/8" |
| 30 | 29 - 1/2" |
| 36 | 34 - 3/8" |

Dimensions reflect stock MANABLOC sizes.

MANABLOC Pressure Drop Table Expressed as PSI Drop Through Port

| Port Size | Rated Flow | PSI Drop |
|-----------|------------|----------|
| 3/8" | 2.5 gpm | 2 psi |
| 1/2" | 4 gpm | 3.4 psi |



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Wichita, KS 67202
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Fax: 1-800-976-9817

service@viega.com
www.viega.com

GRUNDFOS 1/2 HORSEPOWER PUMP

[RELATED SECTION 22 11 23]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of the Solar Homestead.

Model Number: JPF3A

Location: underneath Outdoor Shower

Dimensions:

Length: 16-1/4"

Width: 9-1/8"

Height: 8-1/2"

Weight: 36 lbs

Finish: Cast iron

Features:

Flow range: 1.7 - 12.2 gpm

Maximum working pressure: 87 psi

Maximum fluid temperature range: 14°F - 104°F [-10°C - 40°C]

Electrical:

Horsepower: 1.5 hp

Wattage: 850 W

Voltage: 230 V

Available: Grundfos



General data

JPF3A Pump package*

Cast Iron



*Available in Canada

JPS2A Pump package*

Stainless Steel



*Available in Canada

Features and Benefits

Assembled jet-pump and tank package. Available with rugged 1/2 hp cast iron pump or corrosion-resistant stainless steel pump, mounted on a stainless steel, 6.3 gallon (24 Litre) diaphragm tank.

Package comes complete with pressure switch, gauge, hose and fittings, ready for installation.

Materials: JPF3A Pump Package

| Descriptions | Material |
|-------------------------|--------------------------|
| Motor Stool | Cast Iron |
| Shaft Seal | Carbon/Ceramic/NBR |
| O-Rings and Gaskets | NBR |
| Base Plate | Cast Iron |
| Pump Housing | Cast Iron |
| Impeller | Noryl® |
| Motor Shaft | Stainless Steel AISI 416 |
| Tubing | Polyethylene |
| Diffuser | Noryl® |
| Venturi Tube and Nozzle | Noryl® |
| Tank | Stainless Steel AISI304 |
| Bladder | Butyl |

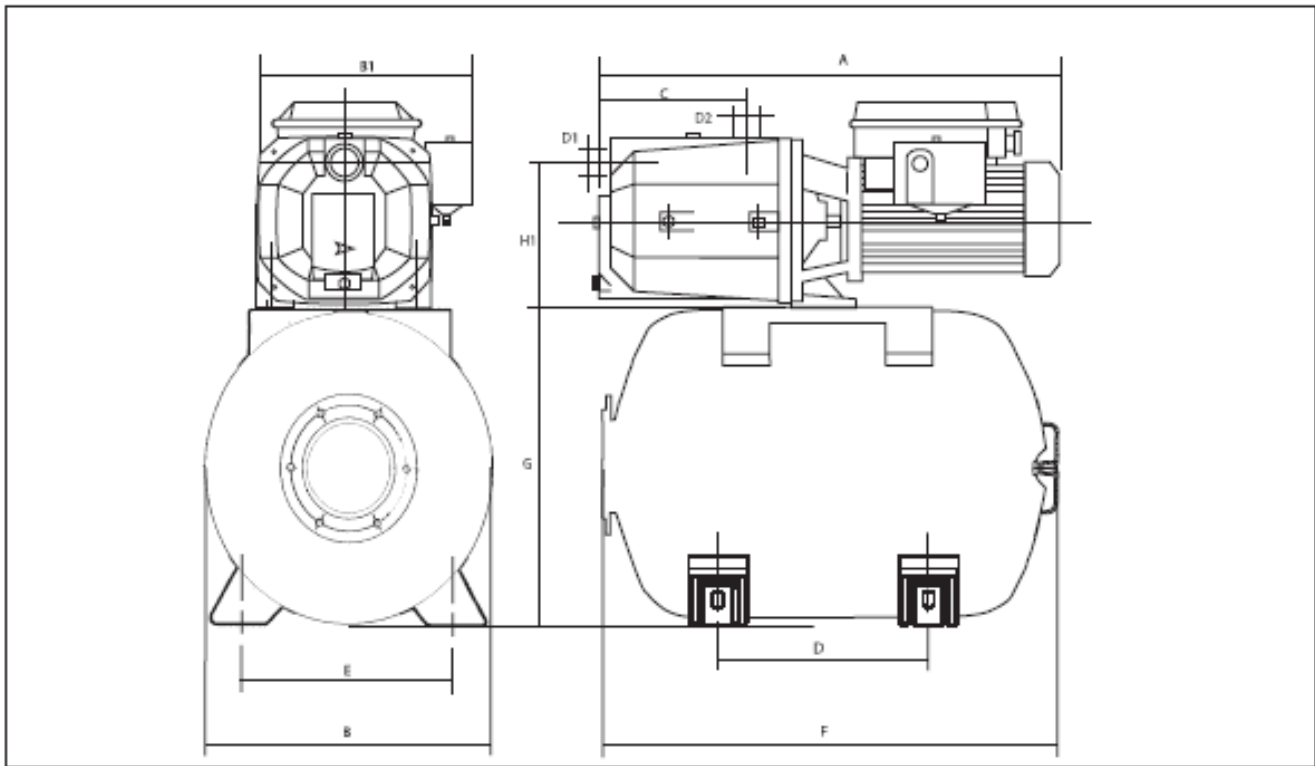
Note: Noryl® is a registered trademark of General Electric Company

Materials: JPS2A Pump Package

| Descriptions | Material |
|----------------------------------|--------------------------|
| Motor Stool | Cast Iron |
| Shaft Seal | Carbon/Ceramic/NBR |
| O-Rings and Gaskets | NBR |
| Base Plate | Steel |
| Pump Housing | Stainless Steel AISI304 |
| Impeller | Noryl® |
| Motor Shaft | Stainless Steel AISI 303 |
| Tubing | Polyethylene |
| Seal Cover | Stainless Steel AISI304 |
| Nozzle-Venturi Diffuser Assembly | Noryl® |
| Tank | Stainless Steel AISI304 |
| Bladder | Butyl |

Note: Noryl® is a registered trademark of General Electric Company

Dimensional Drawings



Dimensions and Weights

| Pump Type | Motor Data | | | | D1 Suction NPT | D2 Disch. NPT | Dimensions (inches) | | | | | | | | | Ship Wt. (lbs) | Ship Vol. (Cu Ft.) |
|-----------|------------|------|----|------------|----------------|---------------|---------------------|------|-----|-----|-----|-----|------|------|-----|----------------|--------------------|
| | HP | S.F. | PH | Volts | | | A | B | B1 | C | D | E | F | G | H1 | | |
| JPF3A | 1/2 | 1.6 | 1 | 115 or 230 | 1" | 1" | 1.2 | 11.9 | 9.1 | 5.5 | 9.1 | 7.1 | 15.2 | 11.9 | 6.0 | 7.0 | 5.0 |

Shallow Well Performance Chart

| Model | HP | Depth to Water | Discharge Pressure (PSI) | | | | | | | Shut-off (PSI) | Pressure Switch Settings (PSI) |
|-------|-----|----------------|--------------------------|-----|----|-----|-----|----|----|----------------|--------------------------------|
| | | | 20 | 30 | 35 | 40 | 45 | 50 | 55 | | |
| JPF3A | 1/2 | 5 | 12 | 11 | 11 | 10 | 7 | 6 | 4 | 73.5 | 30-50 |
| | | 10 | 10.5 | 10 | 10 | 9.5 | 7 | 6 | 4 | 71 | |
| | | 15 | 9 | 8.5 | 8 | 8 | 7 | 6 | 4 | 68.5 | |
| | | 20 | 7.5 | 7 | 7 | 7 | 6.5 | 6 | 4 | 66 | |
| | | 25 | 5 | 5 | 5 | 5 | 4.5 | 4 | 4 | 63.5 | |

* Capacities given are for near-sea level installations.

ROTONICS LOAF WATER TANK**[RELATED SECTION 22 12 19]**

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of the Solar Homestead.

Model Number: 6457 H

Location: east of the north ramp beneath straw bales

Dimensions:

Length: 62-1/2"

Width: 41-1/2"

Height: 30"

Weight: 95 lbs

Features:

Capacity: 300 gal

8" lid opening

Molded-in grooves for easy tie down

Impact and corrosion resistant

Seamless, one-piece construction

Materials NSF-61 approved

Approval Certificates:

ANSI/ MSF

Available: Rotonics



Rotonics Loaf and Pickup Truck Tanks



- Industrial and agricultural tanks designed for transporting and sprayer applications.
- Ideal for numerous farming containment needs, from farm chemicals to potable water.
- Impact and corrosion resistant.
- Molded-in grooves for easy tie down.
- Available in Crosslink Polyethylene or FDA approved High Density Linear Polyethylene (ANSI/NSF Standard 61).

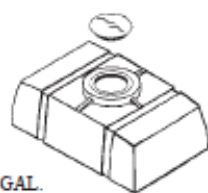
- Seamless, one piece construction.
- Polyethylene offers tremendous chemical resistance.
- RMI Polyethylene Tanks are very durable, yet lightweight, and easy to install and clean.
- Molded-in tie downs secure tanks.
- Low profile for cab visibility.
- FDA approved High Density Linear Polyethylene (ANSI/NSF Standard 61).
- Available in sizes to fit both full size and compact pickup trucks.



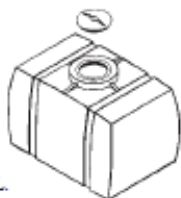
Loaf Tanks

www.rotonics.com/tanks/RMIloaf.htm

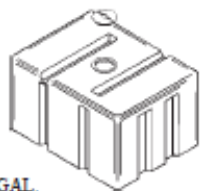
| Item# | Size (Gal.) | Ht. w/Lid (In.) | Width (In.) | Length (In.) | Lid (In.) |
|-------|-------------|-----------------|-------------|--------------|-----------|
| 6435 | 50 | 16 | 26 | 41 | 8 |
| 6440 | 100 | 29 | 26 | 41 | 8 |
| 6453 | 200 | 28 | 36 | 48 | 8 |
| 6457 | 300 | 30 | 42 | 63 | 8 |



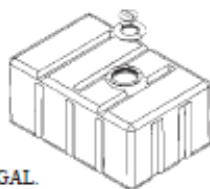
50 GAL.



100 GAL.



200 GAL.



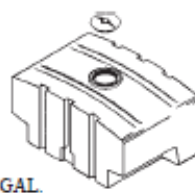
300 GAL.



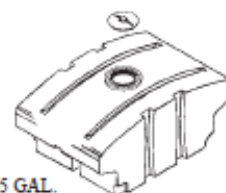
Pickup Truck Tanks

www.rotonics.com/tanks/RMI/pickup.htm

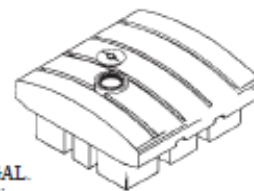
| Item# | Size (Gal.) | Ht. w/Lid (In.) | Width (In.) | Length (In.) | Lid (In.) |
|-------|-------------|-----------------|-------------|--------------|-----------|
| 36925 | 195 | 29 | 61 | 38 | 8 |
| 36930 | 295 | 29 | 61 | 60 | 8 |
| 36935 | 475 | 49 | 65 | 45 | 8 |



180 GAL.
Compact



195 GAL.
Full Size

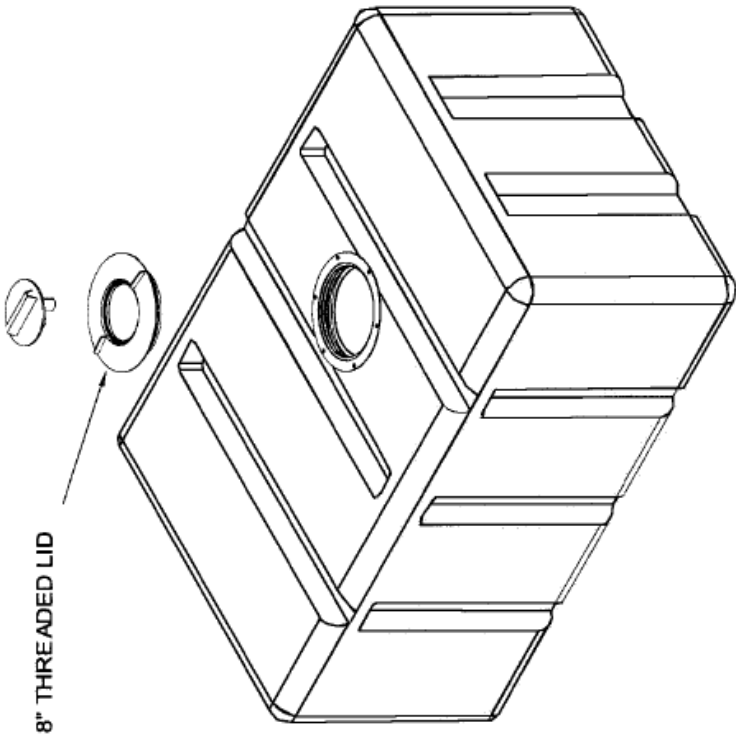
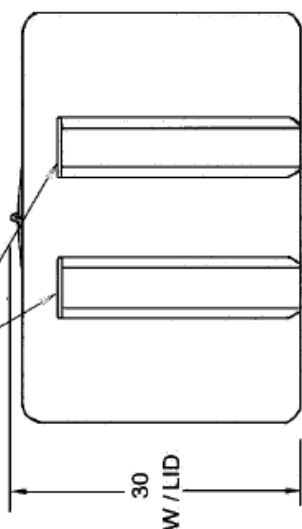
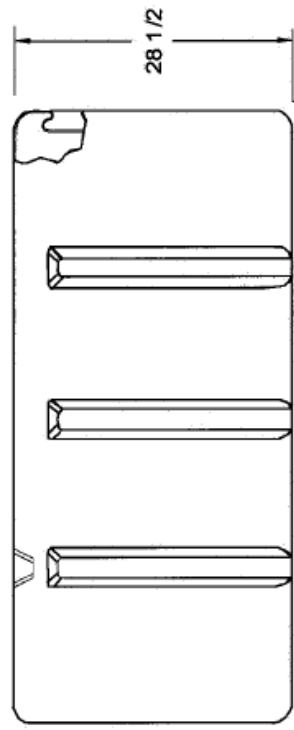
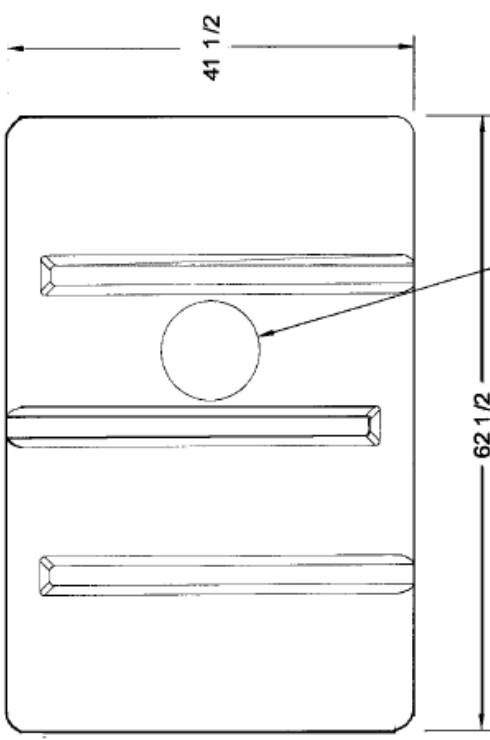


295 GAL.
Full Size

Limited Tank Warranty: RMI warrants to the original purchaser all tanks manufactured by RMI to be free from defects in material and workmanship for a period of five (5) years from date of manufacture, with the exception of D.O.T. and Septic Tanks, which have a special warranty. The Guido Tanks also have a (5) year warranty. Review the chemical resistance guide and warranty instruction information prior to the installation and use of RMI Tanks. Hard-plumbing of tanks is not recommended due to the expansive/contractive characteristics of Polyethylene. All weights, dimensions, and gallonage markers are approximate.

Rotonics Manufacturing Inc.
716 North 11th Avenue • Caldwell, ID 83605
Phone: (208) 454-9271 • Fax: (208) 454-3089
E-mail: idaho@rotonics.com
www.rotonics.com

THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OTHER THAN BY THE OWNER. THE DRAWING & DESIGN ARE PROPERTY OF ROTONICS MANUFACTURING, INC. ALL DIMENSIONS SHOWN ARE OUTSIDE PART DIMENSIONS IN INCHES, AND MAY VARY DUE TO MATERIAL SHRINKAGE. SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. GALLONS AND WEIGHTS ARE APPROXIMATE ONLY.



| | | | | | |
|--------------------|----------|------|--------|-----------------------|--------|
| DO NOT SCALE | | DATE | | RMI-G | |
| APPROVALS | DRAWN BY | RD. | 9/8/03 | 17038 S. FIGUEROA ST. | |
| DESIGN BY: | DPHAM | | | GARDENA, CA 90248 | |
| CHECKED BY: | | | | Phone: (310) 327-5401 | |
| APPROVED BY: | | | | Fax: (310) 323-9567 | |
| #6457 | | | | 300 gal. LOAF TANK | |
| ROTONICS MFG. INC. | | | | SIZE | A |
| www.rotomics.com | | | | DWG. No. | S-1127 |
| | | | | SCALE: | 1 = 20 |
| | | | | REV. | |
| | | | | SHEET 1 of 1 | |

| | | | | | | | |
|-------|---|-------|--|-------|---|-------|---|
| RMI-F | 230 Bartow Mun. Airport Bartow, FL 33830 Phone: 863-534-1766 Fax: 863-533-0407 | RMI-D | 6770 Brighton Blvd. Commerce City, CO 80022 Phone: 303-227-9300 Fax: 303-227-9308 | RMI-I | 716 No. 11th Avenue Cardwell, ID 83605 Phone: 208-454-9271 Fax: 208-454-3089 | RMI-C | 736 Birginal Drive Bensenville, IL 60106 Phone: 630-773-9510 Fax: 630-773-4274 |
|-------|---|-------|--|-------|---|-------|---|

WELLSAVER 20 GALLON PUMP TANK

[RELATED SECTION 22 12 19]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of the Solar Homestead.

Model Number: LPT-20H

Location: underneath Outdoor Shower

Dimensions:

Diameter: 15"

Height: 17"

Finish: blue high UV powder coat

Features:

Capacity: 20 gal

Drawdown gallons:

7.4 gallons @ 20-40 PSI

6.2 gallons @ 30-50 PSI

5.4 gallons @ 40-60 PSI

4" fill cap

1-1/2" PVC bulkhead fitting

Available: Lowes

Price: \$149.00





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WellSaver 20-Gallon Pump Tank

Item #: 160668 | Model #: LPT-20H

★★★★★ [Be the first to write a review!](#)

\$149.00

Customers Also Viewed



WellSaver 20-Gallon Pump Tank

★★★★★
\$142.00



WellSaver 25-Gallon Pressure Tank

★★★★★
\$177.00



WellSaver 36-Gallon Pump Tank

★★★★★
\$212.00



Utilitech 7 Gallon Pump Tank

★★★★★
\$88.00



Utilitech 52-Gallon Pump Tank

Not Yet Rated
\$267.00

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Tank Type

Horizontal

Drawdown Gallons @ 30-50 PSI

6.2

Drawdown Gallons @ 40-60 PSI

5.4

Color/Finish

High UV powder coat

Color/Finish Family

Blue

Tank Capacity (Gallons)

20.0

Tank Discharge Size (Inches)

1.0

Recommended Size (# of Faucets/Showers)

Up to 7

Height (Inches)

17.0

Diameter (Inches)

15.0

Pressure Relief Valve

No

Warranty

5 year limited warranty

Drawdown Gallons @ 20-40 PSI

7.4

SURE-VENT AIR-ADMITTANCE VALVE

[RELATED SECTION 22 13 19.36]

Model Number: 39016

Location: Flex Bath

Dimensions:

Diameter: 2-5/8"

Length: 4-1/2"

Weight: 0.37 lbs

Features:

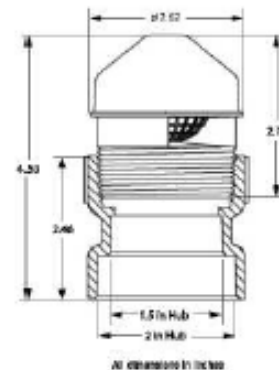
PVC with 2" NPT threads

2" PVC adapter

Available: Oatey



TECHNICAL SPECIFICATION: The purpose of an Air Admittance Valve is to provide a method of allowing air to enter the plumbing drainage system without the use of a vent extended to open air and to prevent sewer gases from escaping into a building. An Air Admittance Valve is a one way valve designed to allow air to enter the plumbing drainage system when negative pressures develop in the piping system. The device shall close by gravity and seal the vent terminal at zero differential pressure (no flow conditions) and under positive internal pressures.



Materials and Dimensions

- Valve – PVC with 2" NPT Threads
- Tension Membrane – Neoprene
- Adapter – 1-1/2" x 2" PVC or ABS

Features

- Rated 20 DFU's for venting DWV 2" and smaller
- Sweet Spot™ technology opens at -0.01 psi and seals at 0 psi and above
- Screening on air inlets to guard the seal
- Protective rubber sleeve provides grip for installation and keeps valve free from debris
- 100% functionally tested at 1/4" H₂O and 30" H₂O ensuring trouble free performance
- Limited Lifetime Warranty

Listings

- ASSE 1050 & 1051
- ICC ESR-1664
- NSF Standard 14
- IAPMO – Classified Mark
- ASTM D 2665/D 2661



Installation: Read installation instructions prior to use of this product. Always consult local plumbing codes prior to installing an AAV. Individual, branch and circuit vents are permitted to terminate with a connection to a Sure-Vent® AAV. The Sure-Vent® AAV will only vent fixtures that are on the same floor and connect to a horizontal branch drain. The horizontal branch drain shall connect to the drainage stack a maximum of four branch intervals from the top of the stack. The Sure-Vent® AAV should be located within the maximum developed length permitted for the vent. The Sure-Vent® AAV must be located a minimum of 4 inches above the horizontal branch drain and 6 inches above any insulation material and within 15 degrees of vertical. Every structure in which plumbing is installed shall have at least one primary stack vent. The stack vent should run as directly as possible from the building drain through to the open air.

Apply approved pipe joint compound or thread seal tape to the male threads of the valve. Remove protective orange rubber sleeve after installation.

Sure-Vent® AAV are intended for installation in the confines of a structure, cannot be exposed to outside elements and are intended for use between -40° F and 150° F. AAVs must be accessible for inspection and service.

Code Approvals

- International Plumbing Code (IPC) 2003
- International Residential Code (IRC) 2003

| ✓ | PRODUCT NUMBER | DESCRIPTION | PACK | CARTON WEIGHT |
|---|----------------|---|------|---------------|
| | 39016 | 20 DFU AAV with 1-1/2" x 2" PVC Schedule 40 adapter | 6 | 2.2 lbs. |
| | 39018 | 20 DFU AAV with 1-1/2" x 2" ABS Schedule 40 adapter | 6 | 2.2 lbs. |
| | 39017 | 20 DFU AAV with 1-1/2" x 2" PVC Schedule 40 adapter | 50 | 18 lbs. |
| | 39019 | 20 DFU AAV with 1-1/2" x 2" ABS Schedule 40 adapter | 50 | 18 lbs. |
| | 39238 | 20 DFU AAV with mechanical adapter | 12 | 4 lbs. |

Data is subject to manufacturing tolerances.

HUSKY CUSTOM WASTE WATER BLADDER TANK

[RELATED SECTION 22 13 53]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of the Solar Homestead.

Model Number: Custom

Location: underneath Deck

Dimensions:

Length: 240"

Width: 60"

Height: 8"

Weight: 60 lbs

Features:

Capacity: 500 gal

Folds down for compact storage

1-1/2" flange and ball valve

2" PVC vent

3" PVC bulkhead fitting

4" fill cap

Approval Certificates:

NSF-61

Available: The Tank-Depot

Price: \$514.99





866-926-5603



| | | | | | | | | |
|-------------------|----------------|------------------|-------------|-------------------|------------------------|------------------|------------------|------------|
| water tanks | septic tanks | marine tanks | RV tanks | transport tanks | chemical storage tanks | bio-diesel tanks | rain barrels | fuel tanks |
| double wall tanks | IBC containers | spill prevention | landscaping | material handling | laundry trucks | battery boxes | tank accessories | |

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You are here: [Home](#) > [Plastic Water Tanks](#) > [Portable Containment Tanks](#) > [Collapsible Pillow Tanks](#) > [Gray Water Pillow Tanks](#)



Husky 500 Gallon Gray Water Bladder Tank



Bladder tanks have unlimited practical uses including:

- Providing drinking water storage for disaster area victims
- Additional fresh water for boats or RV
- Waste water containment
- Rain Water Collection for Irrigation Systems
- Pesticides and insecticides
- Nurseries
- Farming, watering livestock or treating with insecticides
- Fuel storage, diesel, gas, jet, etc.
- Gray water storage for pressure washing systems



- Fire Fighting
- Black Water (sewage)
- Flatbed Truck Tanks
- Railcar Tanks
- Materials NSF-61 Approved (potable water)
- 25-75 gal. comes with a 3/4" Flange and Ball Valve
- 1 1/2" Flange and Ball Valve Standard on Sizes 100-1000 gal.
- 4" Fill Cap or 7" Diameter Fill Sleeve
- Easy to Handle, Folds down for Compact Storage

Part Number: HPC-BT-500

Capacity: 500 Gallons

Size: 84"L x 108"W x 16"H

Weight: 33 lbs.

Ships From: OK

[Freight Calculator](#)

Online Price: \$514.99

+ ADD TO CART

HUSKY 25 GALLON WASTE WATER BLADDER TANK

[RELATED SECTION 22 13 53]

This is a temporary facility that is only used for the purposes of the competition in Washington, D.C. and does not apply to the affordability of the Solar Homestead.

Model Number: HPC-BT-25

Location: underneath the Great Porch

Dimensions:

Length: 24"

Width: 36"

Height: 8"

Weight: 10 lbs

Features:

Capacity: 25 gal

Folds down for compact storage

Material: polyester

Hydrostatic resistance: 500 psi

1-1/2" Flange and Ball Valve

2" PVC Vent

3" PVC Bulkhead Fitting

4" Fill Cap

Approval Certificates:

NSF-61

Available: The Tank-Depot

Price: \$234.99





866-926-5603



| | | | | | | | | |
|-------------------|----------------|------------------|-------------|-------------------|------------------------|------------------|------------------|------------|
| water tanks | septic tanks | marine tanks | RV tanks | transport tanks | chemical storage tanks | bio-diesel tanks | rain barrels | fuel tanks |
| double wall tanks | IBC containers | spill prevention | landscaping | material handling | laundry trucks | battery boxes | tank accessories | |

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Husky 25 Gallon Gray Water Bladder Tank



Bladder tanks have unlimited practical uses including:

- Providing drinking water storage for disaster area victims
- Additional fresh water for boats or RV
- Waste water containment
- Rain Water Collection for Irrigation Systems
- Pesticides and insecticides
- Nurseries
- Farming, watering livestock or treating with insecticides
- Fuel storage, diesel, gas, jet, etc.
- Gray water storage for pressure washing systems
- Fire Fighting
- Black Water (sewage)
- Flatbed Truck Tanks
- Railcar Tanks
- Materials NSF-61 Approved (potable water)
- 25-75 gal. comes with a 3/4" Flange and Ball Valve
- 1 1/2" Flange and Ball Valve Standard on Sizes 100-1000 gal.
- 4" Fill Cap or 7" Diameter Fill Sleeve
- Easy to Handle, Folds down for Compact Storage



Part Number: HPC-BT-25

Capacity: 25 Gallons

Size: 24"L x 36"W x 8"H

Weight: 10 lbs.

Ships From: OK

[Freight Calculator](#)

Online Price: \$234.99

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Offline now.
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ADD TO CART

ZURN SMALL AREA ROOF DRAIN

[RELATED SECTION 22 14 26.13]

Model Number: RD2080

Dimensions:

Diameter: 8-3/8" [213 mm]

Length: 9-7/8" [275 mm]

Features:

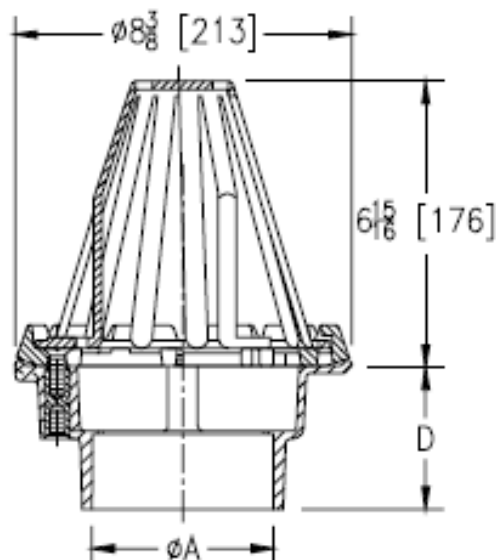
2" PVC hub connections

Dura-Coated cast iron clamp device with an integral gravel guard and a polyethylene dome strainer

Available: Murray Supply



Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



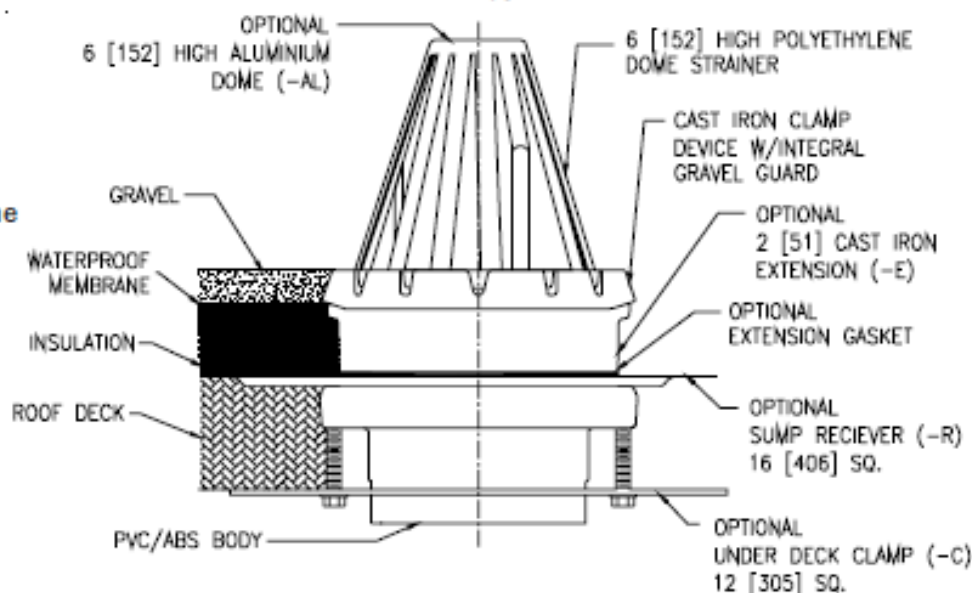
| Product | 'A' Connections | D | Dome Open Area Sq. In. [cm ²] |
|------------|-----------------|--------------|--|
| RD2080-PV2 | 2 [50] PVC Hub | 2 31/32 [76] | 15 [97] |
| RD2080-PV3 | 3 [75] PVC Hub | 3 11/16 [94] | |
| RD2080-PV4 | 4 [100] PVC Hub | 3 13/16 [97] | |
| RD2080-AB2 | 2 [50] ABS Hub | 2 31/32 [76] | |
| RD2080-AB3 | 3 [75] ABS Hub | 3 11/16 [94] | |
| RD2080-AB4 | 4 [100] ABS Hub | 3 13/16 [97] | |

RD2080 8 [203] DIAMETER SMALL ROOF DRAIN Constructed of a PVC or ABS body, complete with steel-threaded inserts for increased strength and longevity. Standard to the roof drain is a Dura-Coated cast iron clamp device with an integral gravel guard and a polyethylene dome strainer.

OPTIONS:

- AL** Aluminum Dome Strainer
- C** Underdeck Clamp
- CI** Cast Iron Dome Strainer
- E** Extension Flange
- R** Roof Sump Receiver
- VP** Vandal Proof Screws for Dome

Typical Installation



Features

- Recommended for installation in flat areas with decks that are constructed of steel, wood, or concrete.
- Cast iron clamp device is provided to ensure strength and stability necessary for water-tight seal.
- PVC or ABS plastic body easily adapts to plastic pipe, simplifying the installation process.

STIEBEL ELTRON TEMPRA TANKLESS WHOLE HOUSE WATER HEATER**[RELATED SECTION 22 33 13]**

Model Number: 24

Location: Main House Mechanical Closet

Dimensions:

Width: 16-5/8" [420 mm]

Height: 14-1/2" [369 mm]

Depth: 4-5/8" [117 mm]

Weight: 15.4 lbs [7.3 kg]

Features:

Minimum required circuit breaker size: 2 x 50 A

Recommended wire size: 2 x 6 AWG copper

Working pressure: 150 psi

Minimum water flow 0.58 gpm

3/4" NPT water connections

Electrical:

Wattage: 18 kW

Voltage: 208 V

Current: 2 x 44 A

Approval Certificates:

ETL

Available: e-Tankless Water Heaters

Price: \$674.00





Stiebel Eltron Tempra 24 Tankless Water Heater



| Maximum Flow Rate in Gallons Per Minute at 105°F Output temp | |
|--|-----------------|
| Incoming Water Temp: | Flow Rate (GPM) |
| 40°F | 2.5 GPM |
| 45°F | 2.7 GPM |
| 50°F | 3.0 GPM |
| 55°F | 3.3 GPM |
| 60°F | 3.6 GPM |
| 65°F | 4.1 GPM |
| 70°F | 4.7 GPM |
| 75°F | 5.4 GPM |

* this chart is based on 240v input. Please review the Stiebel Eltron Tempra Brochure for temp rise data at 208v input.

Sale Price: US\$674.00

Lowest Price Guarantee!

Shipping Options:

Ground (1-2 weeks): included

Express (2-3 days): \$49.95

Overnight: call 1-866-376-2690 for quote

BUY NOW



Sale Price: CDN\$674.00

Why the price difference?

Shipping Options:

Ground (1-2 weeks): included

Express (2-3 days): \$49.95

Overnight: call 1-866-376-2690 for quote

BUY NOW



Our most popular heater for whole house applications, the Stiebel Eltron Tempra 24 electric tankless water heater is a powerful 24 KW heater is an excellent choice for most whole house applications in the Northern U.S., Canada, and other regions where the incoming water temperature can drop below 45° F. The Tempra 24 is also frequently used in warmer southern climates for applications requiring higher flow rates of up to 5 gallons per minute (large Roman-style or jacuzzi tubs, simultaneous showers, etc.), as well as for commercial applications.

Like all Tempra Series tankless water heaters, the Tempra 24 features **true microprocessor-controlled temperature regulation** and a dial selector which allows you to set the desired output water temperature at any level between 86 and 140F (30 and 60C). It is one of the only tankless water heaters on the market that features a **true thermostatic temperature control** and **full power-modulation based on both the incoming water temperature and the water flow rate**. The Tempra 24 will automatically adjust its power output to accommodate changes in the incoming water temperature and flow rate so it can precisely maintain the desired output temperature. The result is the most precise temperature control of any tankless water heater on the market today!

TEMPRA® & TEMPRA® PLUS SERIES TANKLESS ELECTRIC WHOLE HOUSE WATER HEATERS SUBMITTAL SHEET

STIEBEL ELTRON

Simply the Best

TEMPRA® & TEMPRA® PLUS SERIES TANKLESS ELECTRIC WHOLE HOUSE WATER HEATERS. 208-240V RESIDENTIAL AND COMMERCIAL APPLICATIONS.

Specifications

| Temptra® Model | | 12 / 12 Plus | 15 / 15 Plus | 20 / 20 Plus | 24 / 24 Plus | 29 Plus | 36 Plus** |
|--|------------|-----------------|-----------------|-----------------|-----------------|---------------|---------------|
| Item Number | | 223A20 / 22A196 | 223A21 / 22A197 | 223A22 / 22A198 | 223A24 / 22A199 | 223A25 | 223A26 |
| Phase | | single | 2 x single | 2 x single | 2 x single | 3 x single | 3 x single |
| Voltage | V | 208 240 | 208 240 | 208 240 | 208 240 | 208 240 | 208 240 |
| Wattage | KW | 9 12 | 10.8 14.4 | 14.4 19.2 | 18 24 | 21.6 28.8 | 27 36 |
| Amperage | A | 44 50 | 2 x 26 2 x 30 | 2 x 35 2 x 40 | 2 x 44 2 x 50 | 3 x 35 3 x 40 | 3 x 44 3 x 50 |
| Min. Required circuit breaker size | A | 60 60 | 2 x 40 2 x 40 | 2 x 50 2 x 50 | 2 x 60 2 x 60 | 3 x 50 3 x 50 | 3 x 60 3 x 60 |
| Recommended wire size | AWG COPPER | 6 6 | 2 x 8 2 x 8 | 2 x 8 2 x 8 | 2 x 6 2 x 6 | 3 x 8 3 x 8 | 3 x 6 3 x 6 |
| Maximum temperature increase above ambient water temp. | @ 1.50 GPM | 41 54 | 49 65 | 66 88 | 82 92 | 92 92 | 92 92 |
| | @ 2.25 GPM | 27 36 | 37 43 | 44 58 | 54 73 | 66 87 | 82 92 |
| | @ 3.00 GPM | 20 27 | 25 33 | 33 44 | 41 54 | 49 66 | 61 82 |
| | @ 4.50 GPM | - - | - - | 22 29 | 27 37 | 33 44 | 41 55 |
| Min. water flow to activate unit | GPM/l/min | 0.37 / 1.4 | 0.58 / 2.2 | 0.58 / 2.2 | 0.58 / 2.2 | 0.87 / 3.3 | 0.87 / 3.3 |
| Weight | lb / kg | 13.2 / 6.1 | 15.4 / 7.3 | 15.4 / 7.3 | 15.4 / 7.3 | 17.6 / 8.6 | 17.6 / 8.6 |
| Nominal water volume | Gal | 0.13 / 0.5 | 0.26 / 1.0 | 0.26 / 1.0 | 0.26 / 1.0 | 0.39 / 1.5 | 0.39 / 1.5 |
| Max. Inlet temperature | F / C | 131 / 55 | | | | | |
| Width | Inch / cm | 16 5/8 (42.0) | | | | | |
| Height | Inch / cm | 14 1/2 (36.9) | | | | | |
| Depth | Inch / cm | 4 5/8 (11.7) | | | | | |
| Working pressure | PSI / BAR | 150 / 10 | | | | | |
| Tested to pressure | PSI / BAR | 300 / 20 | | | | | |
| Water connections | | 3/4" NPT | | | | | |

* Suitable for supply with up to 131°F / 55°C

** Tankless water heaters are considered a non-continuous load

* Conductors should be sized to maintain a voltage drop of less than 3% under load

** Requires a 100A main service

Description

- Saves Energy and Reduces Your Electric Bills
- Residential or commercial applications
- Outperforms bulky hot water tanks
- Reduces hot water pipe runs
- Reduces piping losses
- Made in Germany
- No venting required
- Sleek design fits in anywhere
- 3-year warranty
- Seismic proof construction
- Microprocessor control
- Accurate temperatures (from 86 °F - 140 °F) ensure code compliance is easy
- No mixing valve, drain valve, or T&P* valve required (*Except in MA, or where local code dictates)

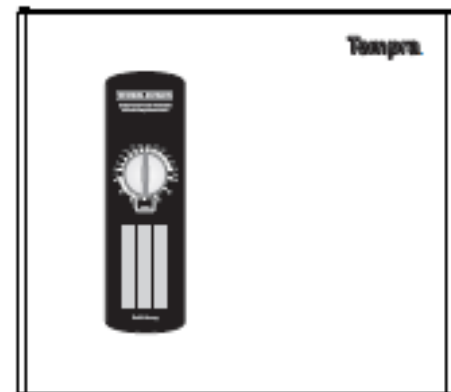
Temptra® Plus featuring Advanced Flow Control™

Advanced Flow Control is exclusive to the Temptra® Plus and ensures a constant temperature output no matter how great the hot water demand is.

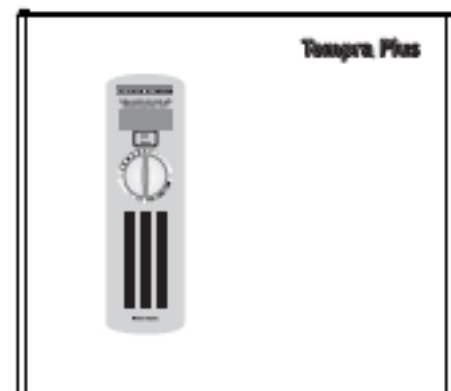
Advanced Flow Control technology works by automatically adjusting the flow of water to eliminate unpleasant temperature fluctuations. This ensures an accurate temperature output at all times.



ISO 9001
CERTIFIED



Temptra® 12-24



Temptra® 12-36 Plus

STIEBEL ELTRON TEMPRA POINT-OF-USE WATER HEATER**[RELATED SECTION 22 33 13]**

Model Number: 220817 - MINI 6

Location: Flex Space and Outdoor Kitchen Mechanical Closet

Dimensions:

Width: 7-1/2" [165 mm]

Height: 6-1/2" [190 mm]

Depth: 3-1/4" [82 mm]

Weight: 3.44 lbs [1.56 kg]

Features:

Minimum required circuit breaker size: 30 A

Recommended wire size: 10 AWG

Working pressure: 150 psi

Minimum water flow: 0.85 gpm

3/8" outside diameter flex connector

Electrical:

Wattage: 537 W

Voltage: 220-240 V

Current: 24.7 A

Approval Certificates:

ETL

Available: e-Tankless Water Heaters

Price: \$159.00





Stiebel Eltron Mini™ 6 Point-of-Use Tankless Water Heater

The Stiebel Eltron Mini™ Series tankless water heaters are economical, ultra-compact, attractive point-of-use tankless water heaters designed for consistent, low-flow point of use applications. The Mini Series is most suited to applications in which a relatively constant flow rate is used. If the flow rate of your application is likely to fluctuate due to varying water demands or varying water pressures, etc., we recommend that you consider a [DHC-E 8 tankless water heater](#) instead as they include thermostatic control and flow-based power modulation technology.

Due to its compact size, the Stiebel Eltron Mini 6 easily fits directly under a sink or an adjacent cupboard or closet, so it delivers hot water straight to the sink with almost no delay. By locating the heater right next to where the hot water will be used, you can also virtually eliminate thermal heat loss which is commonly associated with long pipe runs. If the Mini 6 is able to supply all of the hot water needs for the entire room, you can also eliminate the need to run a hot water line all the way from the main central water heater in new construction applications.

The Mini 6 is extremely energy efficient as it produces hot water on demand only as it is required. A sophisticated water flow sensor recognizes when hot water is being used and activates and deactivates the unit automatically so it only runs when you are actually using water. This eliminates standby thermal heat losses often associated with traditional tank style water heaters. Due to this, you can expect to see a significant cost reduction over the operating cost of a conventional water heater.



| Maximum Flow Rate in Gallons Per Minute at 105F Output Temperature | |
|--|-----------------|
| Incoming Water Temp: | Flow Rate (GPM) |
| 40F | not recommended |
| 45F | not recommended |
| 50F | not recommended |
| 55F | not recommended |
| 60F | 0.86 GPM |
| 65F | 0.97 GPM |
| 70F | 1.11 GPM |
| 75F | 1.29 GPM |
| 80F | 1.55 GPM |

* This chart is based on 240v power input. Please see brochure for temp rise chart based on 208v input or email us for details.

Sale Price: US\$159.00

Sale Price: CDN\$184.34

[Why the price difference?](#)



Shipping Options:
Ground (1 week): \$19.95
Express (2-3 days): \$59.95



Shipping Options:
Ground (1 week): \$19.95
Express (2-3 days): \$59.95

Need Help?

Call Toll Free
1-877-374-2696



Let us help you evaluate if tankless is right for you or help you select the best model for your application. Call us now...

Stiebel Eltron Mini 6 Advantages:

- save space
- save energy
- reduce water waste
- simple installation
- very economical
- legendary Stiebel quality



**Stiebel Eltron Mini 6
Tankless Brochure**
Adobe PDF Format



MINI™ SERIES TANKLESS ELECTRIC WATER HEATERS

Technical Data



ISO 9001
CERTIFIED



STIEBEL ELTRON

| Mini™ Model | | Mini™ 3 | Mini™ 4 | | Mini™ 6 | |
|---|-------------|--------------------------------------|------------|-----------|------------|-----------|
| Item Number | | 220816 | 222039 | | 220817 | |
| Phase | | 1 | 1 | 1 | 1 | 1 |
| Voltage | V | 110 - 120 | 208 | 220 - 240 | 208 | 220 - 240 |
| Wattage | kW | 3.0 | 2.9 | 3.5 | 4.7 | 5.7 |
| Amperage | A | 25 | 13.8 | 15.2 | 22.4 | 24.7 |
| Min. required circuit breaker size | A | 30 | 20 | 20 | 30 | 30 |
| Recommended wire size | AWG copper | 10 | 12 | 12 | 10 | 10 |
| Min. water flow to activate unit | GPM / L/min | 0.36 / 1.4 | 0.36 / 1.4 | | 0.85 / 3.2 | |
| Degree of protection according to IEC 529 | | IP 24 | | | | |
| Min. water resistivity | | 2795 Ω x in / 1100 Ω x cm | | | | |
| Weight | lbs / KG | 3.44 / 1.56 | | | | |
| Dimensions (Height/Width/Depth) | in / (cm) | 6.5 (16.5) / 7.5 (19.0) / 3.25 (8.2) | | | | |
| Working Pressure | Psi / bar | 150 / 10 | | | | |
| Tested to Pressure | Psi / bar | 300 / 20 | | | | |
| Volume of water in unit | Gal / L | 0.026 / 0.1 | | | | |
| Water connections | | for 3/8" O.D. flex connector | | | | |

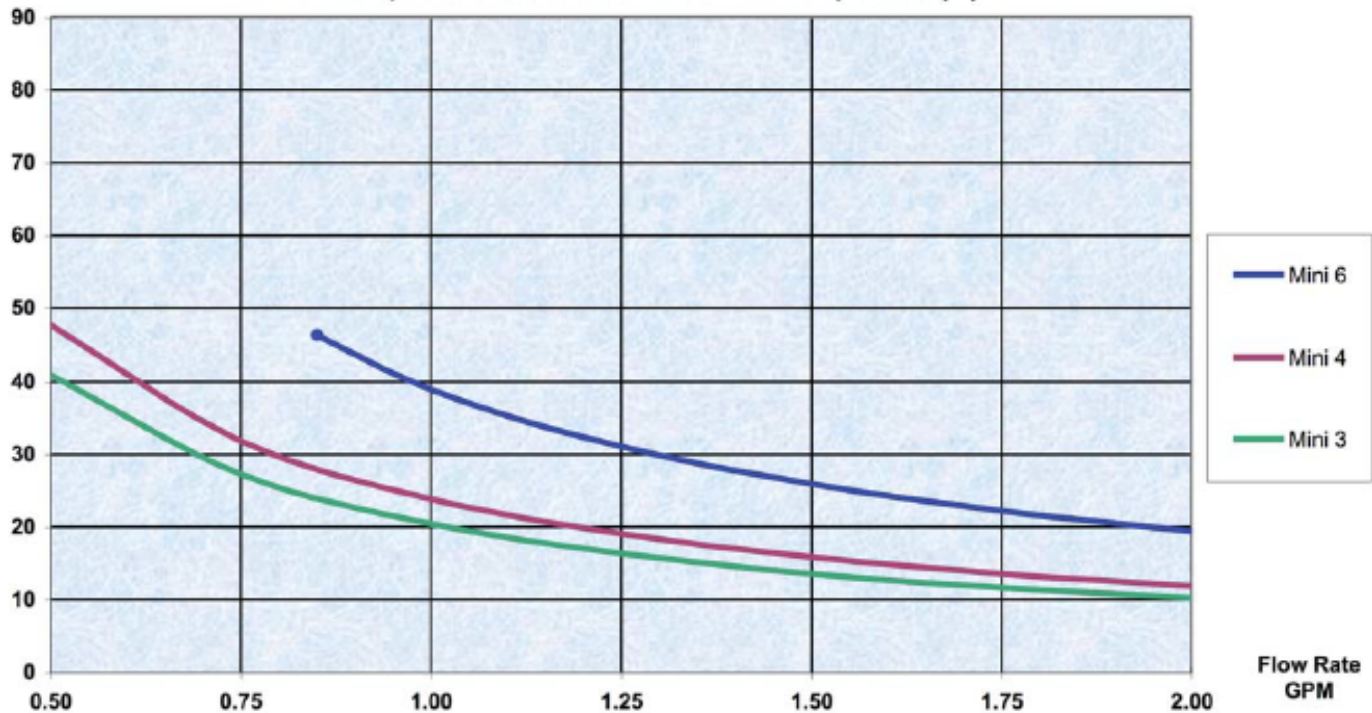


* Suitable for supply with cold water * Tankless water heaters are considered a non-continuous load * Conductors should be sized to maintain a voltage drop of less than 3% under load

Temp Rise
°F

Temperature Rise °F @ 240 V versus Flow Rate GPM

Maximum temperature rise above ambient water temperature (°F)



Limited Warranty (Excerpt): STIEBEL ELTRON, Inc. warrants to the original owner that the Mini™ Series Water Heater will be free from defects in workmanship and materials for a period of THREE YEARS from the date of purchase. Should any part(s) prove to be defective during this period, STIEBEL ELTRON, Inc. will be responsible for replacement of the defective part(s) only. STIEBEL ELTRON, Inc. is not responsible for labor charges.

Distributed by:

STIEBEL ELTRON

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FAX 413.247.3369

info@stiebel-eltron-usa.com

www.stiebel-eltron-usa.com

#18

Printed on chlorine-free paper using soy-based inks.

UTILITECH 2 GALLON WATER HEATER EXPANSION TANK

[RELATED SECTION 22 33 13]

Model Number: LET-2

Location: Main House Mechanical Closet

Dimensions:

Diameter: 8"

Height: 12-1/2"

Finish: blue high UV powder coat

Features:

Capacity: 20 gal

Drawdown gallons:

7.4 gallons @ 20-40 PSI

0.6 gallons @ 30-50 PSI

32.3 gallons @ 40-60 PSI

4" fill cap

1-1/2" PVC bulkhead fitting

Discharge size: 3/4"

Available: Lowes

Price: \$39.00





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[Utilitech 2 Gallon Expansion Tank](#)



Utilitech 2 Gallon Expansion Tank

Item #: 160680 | Model #:LET-2

★★★★★ 2 reviews | [Write a review](#)

\$39.00

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| | | | |
|------------------------------|---------------------|---|----------------|
| Tank Type | Expansion | Recommended Size (# of Faucets/showers) | N/A |
| Drawdown Gallons @ 30-50 PSI | 0.6 | Height (Inches) | 12.5 |
| Drawdown Gallons @ 40-60 PSI | 32.3 | Diameter (Inches) | 8.0 |
| Color/Finish | High UV powder coat | Pressure Relief Valve | No |
| Color/Finish Family | Blue | Warranty | Limited 1 year |
| Tank Capacity (Gallons) | 2.0 | Drawdown Gallons @ 20-40 PSI | 0.7 |
| Tank Discharge Size (Inches) | 0.75 | | |

NEXT GENERATION ENERGY COLLECTOR**[RELATED SECTION 22 33 30.23]**

Model Number: NGE-224-TU

Location: roof over Core Module

Dimensions:

Length: 77-1/2"

Width: 73"

Height: 6-1/4"

Weight: 185 lbs

Features:

Outer tube diameter: 2-1/4"

Inner tube diameter: 1-7/8"

Length of tube: 70-7/8"

Collector casing: aluminum

Aperture area without reflector: 26.26 ft²

Maximum pressure: 87 psi

Inlet/outlet connect: 3/4"

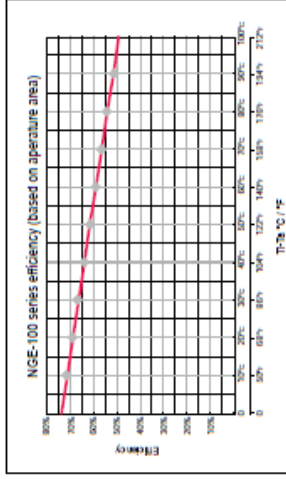
Heat transfer fluid: 0.67 gal

Stagnation temperature with reflector: 482°F

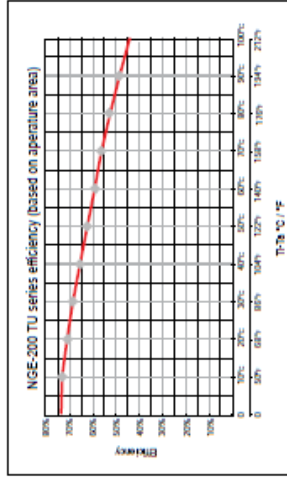
Available: Indoor Environment Systems



NGE 100 Series Efficiency Curves



NGE 200 Series Efficiency Curves



Collector Specification

| MODEL | NGE-116-TU | NGE-216-TU | NGE-104-TU | NGE-214-TU |
|----------------------------------|--|--|--|--|
| Number of tubes | 16 | 16 | 24 | 24 |
| Outer tube diameter | 47 mm (1.85 in) | 58 mm (2.28 in) | 47 mm (1.85 in) | 58 mm (2.28 in) |
| Inner tube diameter | 37 mm (1.46 in) | 47 mm (1.85 in) | 37 mm (1.46 in) | 47 mm (1.85 in) |
| Length | 1500 mm (59.06 in) | 1800 mm (70.86 in) | 1500 mm (59.06 in) | 1800 mm (70.86 in) |
| Collector Casing | Aluminum | | | |
| Aperture area without reflector | 1.09 m ² (11.73 sq.ft) | 1.62 m ² (17.43 sq.ft) | 1.64 m ² (17.65 sq.ft) | 2.44 m ² (26.26 sq.ft) |
| Selective coating | Al-NiAl or Co-SS-NiAl | | | |
| Net weight | 45kg (99.2 lb) | 56 kg (123.5 lb) | 68 kg (150 lb) | 84 kg (185 lb) |
| Max. Pressure | 0.6 MPa (87.0 psia) | | | |
| Inlet/outlet connect | 20 mm (3/4 in) | | | |
| Heat transfer fluid | 1.5litres (0.4gal) | | | |
| Stagnation temp (with reflector) | 250°C (482 ° F) | | | |
| Dimensions L x W x H | 1600 x 1000 x 145mm (63.0 x 42.5 x 5.7 in) | 1970 x 1200 x 145mm (77.5 x 48.4 x 5.7 in) | 1600 x 1500 x 145mm (63.0 x 61.4 x 5.7 in) | 1970 x 1850 x 145mm (77.5 x 73.0 x 5.7 in) |



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NGE - TU Series Solar Thermal Collectors

The Most Efficient Tube Collector On The Market

10 Year Warranty

Year round functionality

Versatile and easy to install

Functions well in cold and windy weather conditions

Extremely durable

Can achieve temps of 400°F



Purchase individual panels or our full NGE domestic hot water package including an 116 gallon tank, pump station, and controller. Other packages available.

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spa & pool heating | domestic hot water | radiant floor heating | energy independence



AVD 809



- Works well in low ambient air temps and in cloudy or windy conditions
- Will receive consistent amount of sun year-round
- Low flow rate = smaller pipes and pumps
- No mechanical parts to wear out
- Designed to integrate with Zilla™ Rac

- The most efficient, cost-effective tube collector on the market today
- Applications include heating, hot water, and cooling
- Can be mounted on any pitch, vertically or horizontally
- 2 NGE-116TU tube collectors provides domestic hot water for an 80 gallon tank
- 25 year life span



NGE TU Powerhouse

The main components of NGE tube collectors are glass, aluminum, copper, and brass. All aluminum is anodized and structurally strong to allow fastening anywhere on the frame, using stainless steel fasteners. The tubes are built to be installed in any direction; horizontal, vertical, manifold up, down, left or right.

NGE TU series collectors work extremely well in all climates. Extreme cloud cover, cold, wind, or rain does not affect this system in the same way as more traditional systems. Our ability to capture infrared energy eliminates the low or zero production typical in cloudy weather. NGE evacuated tube collectors capture and deliver heat to you when you need it the most.

Each of our collectors use significantly less power due to the low flow requirements of the U-tube design. The collectors utilize pipe runs of small diameter due to these low flow requirements. Most NGE domestic hot water systems use 3/8 inch copper line sets.

Our collectors do not need to be disassembled for installation. The 116 series can be assembled and commissioned by a single installer, cutting labor costs. In the rare instance a tube does become damaged, replacement is a snap, completed in a few minutes at minimal cost by one installer. Fluid in the system can be changed out when necessary. Tradespeople who are familiar with closed loop pressurized systems will not need major retraining.

NGE tubes have been designed to interface up with standard size tanks available on the market. Sizing is easy with our "per tube" hot water charts. Because these collectors are so much more efficient and can do more with less light, they can be much smaller. When utilizing the Zilla™ Racking and Mounting system, the NGE TU series are low profile, elegant and efficient solar thermal systems that will function for decades.

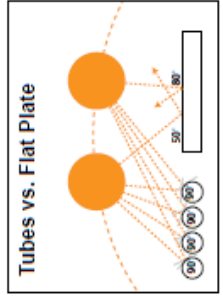


Superior Technology

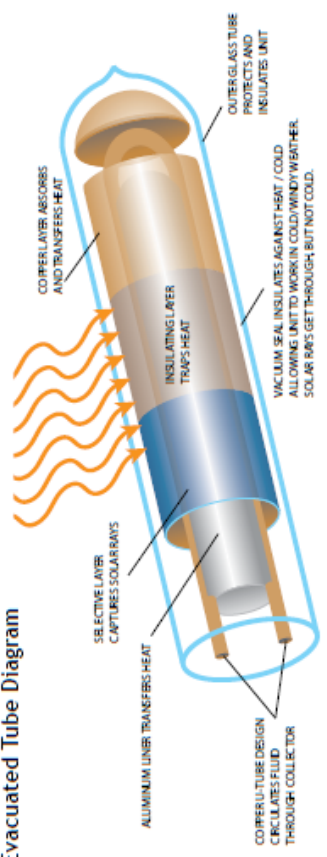
NGE evacuated tube collectors are superior to all other "evacuated tube" collectors for several aesthetic and technological reasons. Our tubes have no mechanical components to wear out. Heat transfer fluid (water or a glycol/water mix) simply circulates through the collector. There are no snap discs, and no copper to copper friction heat transfer connections that lose memory and thus efficiency over time. The three coat absorber process, design of the u-tube collector, and conduction within the internal heat transfer system allows energy to be collected from any angle. There is no need to turn the tube to maximize heat collection. Our collectors, depending upon the mounting method, can have the same angle of incidence throughout the day or season. Our tubes collect energy all day. Typically our collectors are working from 1 hour after sunrise to 1/2 hour before sunset.

Not all collector days are the same. It is important to note that the current and outdated testing methods do not do our collectors justice. For our tubes, there does not need to be a full sun hour or a "90 degree angle of incidence". These collectors make maximum use of the sun of sun all day. Low slope roofs - no problem, steep pitches - no problem, flat roofs - no problem, wall mounts - no problem. In fact, our collectors are the most aesthetically pleasing and easily installed evacuated tube collectors on the market. The absorber surface is 360 degrees, allowing our collectors to capture energy from all angles. They can even capture energy from the backside.

Another key element to our unique design is that the majority of energy transfer of energy to the heat transfer fluid occurs within the vacuum itself. Other designs do this same process outside of the vacuum, resulting in increased heat loss. NGE evacuated tube collectors are simply superior in real world applications



Evacuated Tube Diagram



WICKS & WAX RE-MELT PARAFFIN WAX BLEND

[RELATED SECTION 22 33 30.23]

Model Number: Re-Melt Paraffin Wax Blend

Location: Main House Mechanical Closet

Features:

Collected and re-melted and combined paraffin wax with a melting point of 140°F.

This will be used as a medium for thermal storage in a custom built heat-exchanging device “ASU-LSED.”

Off-white, yellow color

Slight vanilla fragrance

Available: Wicks & Wax



Products

• Featured Products

▼ Wax

- Beeswax
 - Bars
 - Sheets
- Palm Wax
- Paraffin Wax
- Soy Wax

▼ Wicks

- Cotton Square Braid
- HTP Series Wick & Tab
- RRD Series Wick & Tab
- LX series Tabbed Wicks
- Zinc Core
- Flat Lamp

▼ Candles

- Floating
- Tapered
- Pillar Candles
- Votive

▼ Molds

- Plastic Molds
 - 2 Piece Molds
 - Floater Molds
 - Free Standing Candle Molds
 - Fruit Embed Molds
 - Soap Molds
 - Votive Molds

[Home](#) » [Catalog](#) » [Wax](#) » [Paraffin Wax](#)

Re-Melt Paraffin Wax



Save with these paraffin blocks that are melted down candles that were damaged during shipping. Colour is an off-white yellow and has a slight Vanilla fragrance. Melt point 180°. Pour at 200°-210°F.

Blocks weigh approx 2.5kgs (5.5 lbs) each.

Place your order in Kilograms and we will adjust the final price +/- depending on the actual weight of each block.

| Kilograms | Price per kg | You Save |
|-----------|--------------|----------|
| 1-3 | \$3.42 | 0.00% |
| 4-24 | \$2.89 | 15.50% |
| 25-74 | \$2.31 | 32.46% |
| 75-439 | \$2.25 | 34.21% |

This product is sold by weight which varies. Pricing shown is an average price and the actual price may be modified +/- to the nearest available unit weight.

Quantity:

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SUNDA SOLAR COLLECTOR

[RELATED SECTION 22 33 30.23]

Model Number: Seido 2-16

Location: roof over Core Module

Dimensions:

Length: 83-3/4" [2126 mm]

Width: 75-1/2" [1920 mm]

Height: 5-3/8" [150 mm]

Weight: 220.5lbs [100kg]

Features:

Tube construction: SEIDO2---Direct flow vacuum tube with flat absorber

Angle of inclination: 0° to 90°

Number of tube collectors: 16

Absorber area: 2.77 m²

Aperture area: 2.93 m²

Gross area: 4.08 m²

Glass material: borosilicate glass

Glass tube diameter: 100

Wall thickness: 2.5mm

High vacuum, long term stability: <10-5 mbar

Absorber material: aluminum

Selective coating: aluminum nitride

Absorbance: >.92

Emittance: <.08

Insulation: polyurethane foam

Maximum operating pressure: 6 Bar

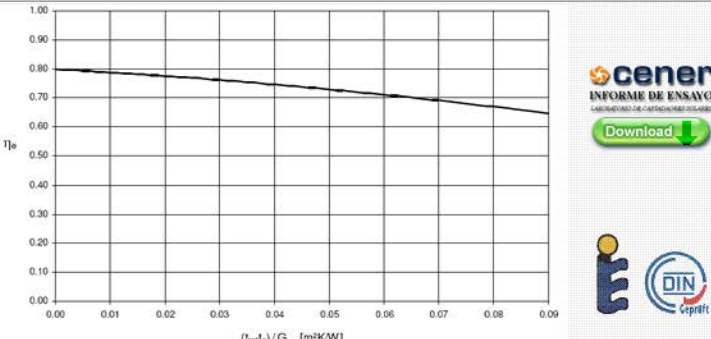
Stagnation temperature module: 190°

Stagnation temperature pipe: 247°C

Available: Alternative Energy Engineering



Technical data

| Module type | SEIDO2-8 | | SEIDO2-16 | |
|----------------------------------|---|-------------------|------------------|---------------------|
| Tube construction | SEIDO2---Direct flow vacuum tube with flat absorber | | | |
| Certificate | EN 12975 | | | |
| Angle of inclination | 0 ° to 90 ° | | | |
| Number of collector tubes | 8 | | | 16 |
| Absorber area | 1.39 m ² | | | 2.77 m ² |
| Aperture area | 1.47 m ² | | | 2.93 m ² |
| Gross area | 2.04 m ² | | | 4.08 m ² |
| Length x width x height (mm) | 2126x960 x150 | | 2126x1920x150 | |
| Weight | 50 kg | | 100 kg | |
| Efficiency curve |  | | | |
| Pressure drop per module | <7 mbar (100L/h) | <20 mbar (200L/h) | <7 mbar (100L/h) | <20 mbar (200L/h) |
| Fluid content per module | 1.3 L | 2.6 L | 1.3 L | 2.6 L |
| Glass material | Borosilicate glass | | | |
| Glass tube diameter | 100 | | | |
| Wall thickness | 2.5mm | | | |
| Transmittance | >0.90 | | | |
| High vacuum, long-term stability | <10-5 mbar | | | |
| Absorber | Aluminium | | | |
| Selective coating | Aluminium nitride | | | |
| Absorptance | >0.92 | | | |
| Emittance | <0.08 | | | |
| Header box material | Aluminium | | | |
| Header box size | 958x108x126mm | 1918x108x126mm | 958x108x126mm | 1918x108x126mm |
| Insulation | Polyurethane foam | | | |
| Max. Operating pressure | 6 bar | | | |
| Stagnation temperature, module | 190° | | | |
| Stagnation temperature, pipe | 247°C | | | |
| Assembling components | Stainless steel vertical supports and bottom supports, aluminum header box, 30 mm thickness polyurethane insulation | | | |
| Connection | Compression fitting , 22mm | | | |

DRAGON BREATH HEATER

[RELATED SECTION 22 33 30.23]

Model Number: DB70

Location: HVAC Compartment

Dimensions:

Length: 7-1/2"

Width: 17-1/2"

Height: 22"

Weight: 50 lbs

Features:

1" water lines

Flow rate: 12 gpm

Speed Controllable

Efficiency:

Efficiency: 69,892 BTU/hr

Current: 1.4 A

Horsepower: 1/30




Available: Alternative Heating & Supplies

Price: \$472.50





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DRAGON BREATH HEATER - 70,000 BTU



Part Number: DB70

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Manufacturer: [Dragon Breath](#)
Material: [20 Gauge Galvanized](#)
Installation Type: [Copper Sweat](#)
Warranty: [1 Year Warranty](#)

Qty:

Availability: **In stock**

Price: **\$472.50**

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Water to Air Unit Heater



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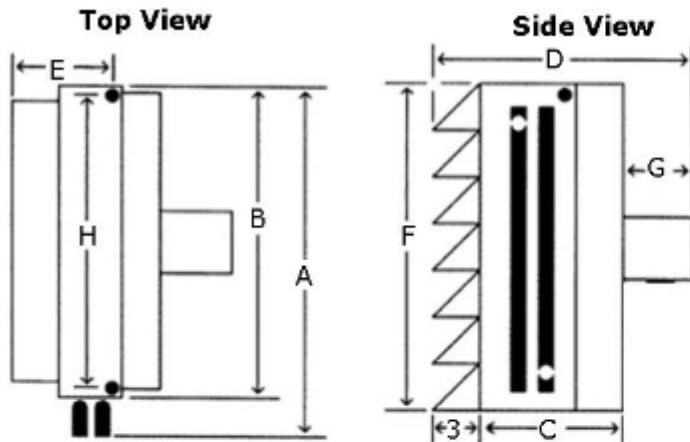
DESCRIPTION

SPECS

OVERVIEW

SHIPPING

REVIEWS



| Part # | A | B | C | D | E | F | G | H= Anchor width | Water Lines =ID | Shipping weight=Lbs | Price |
|--------|--------|----|-------|--------|--------|--------|-------|--------------------|--------------------|------------------------|----------|
| UH18 | 13-5/8 | 10 | 10 | 19-5/8 | 10-1/2 | 10-3/8 | 5 | 10-1/2 | 1" | 30 | \$359.99 |
| DB70 | 22 | 16 | 7-3/4 | 17-1/2 | 7-1/2 | 18-1/8 | 5-1/4 | NA | 1" | 50 | \$472.50 |
| DB100 | 26 | 20 | 7-3/4 | 17-1/2 | 7-1/2 | 20-1/4 | 6 | NA | 1" | 60 | \$567.00 |
| DB150 | 28 | 22 | 7-3/4 | 18-1/2 | 7-1/2 | 22-1/8 | 6-1/2 | NA | 1" | 90 | \$830.25 |
| DB200 | 30 | 24 | 7-3/4 | 19 | 7-1/2 | 24-1/8 | 6-1/2 | NA | 1" | 100 | \$872.10 |

| Part # | BTU / HR EWT-200° | BTU EWT-180° | CFM- Amps | GPM | APD | Speed Controllable | Approximate FOH-WPD | Approximate WTD at 180° | HP |
|--------|----------------------|-----------------|--------------|-----|-----|-----------------------|------------------------|----------------------------|------|
| UH18 | 19,732 | 16,881 | 180-1.4 | 7 | .05 | No | 2.16 | 194° | 1/30 |
| DB70 | 69,892 | 55,506 | 845-1.4 | 12 | .11 | Yes | 2.75 | 170° | 1/30 |
| DB100 | 105,235 | 89,543 | 1107-1.6 | 14 | .10 | Yes | 2.51 | 167° | 1/20 |
| DB150 | 161,163 | 137,567 | 2500-3.9 | 14 | .20 | Yes | 2.41 | 159° | 1/4 |
| DB200 | 210,671 | 183,789 | 3440-4.9 | 15 | .25 | Yes | 2.71 | 157° | 1/4 |

STEELWORKS PLATED PERFORATED TUBE

[RELATED SECTION 23 81 43]

Model Number: 11203

Location: HVAC Compartment

Dimensions:

Length: 3"

Width: 1-1/2"

Height: 1-1/2"

Features:

Gauge: 14

Available: Lowes

Price: \$21.35





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Home : [Search "11203"](#) : Steelworks Plated Perforated Tube 1-1/2 x 3' 14 Gauge



Steelworks Plated Perforated Tube 1-1/2 x 3' 14 Gauge

Item #: 103637 | Model #:11203

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\$21.35

Customers Also Viewed



Steelworks Aluminum Tube (Square) 1 1/2 x 3'



Steelworks Plated Perforated Angle 1 1/2 x 3'



Steelworks Plated Slotted Angle 2-1/4 x 4-1/2'



Steelworks Aluminum Tube (Square) 1 1/2 x 3'



The Hillman Group Plated Slotted Angle 1 1/2 x 3'

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|-------------------|------|----------------|------|
| Length (Inches) | 3.0 | Stock Category | Tube |
| Sheet Metal Gauge | 14.0 | Structural Use | No |

THE HILLMAN GROUP THREADED ROD

[RELATED SECTION 23 81 43]



Model Number: 880990

Location: HVAC Compartment

Dimensions:

Diameter: 1/4"

Length: 36"

Available: Lowes

Price: \$0.58



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The Hillman Group 0.250"Dia. x 72"L Threaded Rod

Item #: 137914 | Model #:880990

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\$0.58

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The Hillman Group
5/16"Dia. x 72"L
Threaded...

Not Yet Rated

\$0.94



The Hillman Group
1/4"Dia. x 12"L
Threaded...

Not Yet Rated

\$3.10



Steelworks 5/16"Dia.
x 72"L Threaded
Rod

Not Yet Rated

\$1.76



The Hillman Group
3/8"Dia. x 36"L
Threaded...

Not Yet Rated

\$0.94



Steelworks 1/4"Dia.
x 36"L Threaded
Rod

Not Yet Rated

\$1.55

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Continuous Thread

Yes

Threads Per Inch

18.0

Length (Inches)

36.0

Application

N/A

Diameter (Inches)

0.19

WILO STANDARD CIRCULATING PUMP

[RELATED SECTION 22 33 30.23]

Model Number: Star 32 F

Location: Main House Mechanical Closet

Dimensions:

Length: 5-1/16"

Width: 5-3/8"

Height: 6-3/8"

Weight: 6.5 lbs

Finish: Cast iron

Features:

Maximum delivery head: 33 ft

Flow rate: 10.5 gpm

Ambient temperature range: 104°F

Maximum working pressure: 140 psi

Number of speed stops: 1

Protection class: F

Electrical:

Wattage: 113 W

Voltage: 115 V

Frequency: 60 Hz





WILO Star Submittal

Classic Star - Cast Iron



Pumpen Intelligenz.

| | |
|---------------|-------|
| Project: | |
| Engineer: | |
| Contractor: | |
| Submitted By: | Date: |
| Approved By: | Date: |

| Tag # | Model # | Flow | Head | Volt | Phase | Comments |
|-------|---------|------|------|------|-------|----------|
| | | | | 115 | 1 | |
| | | | | 115 | 1 | |

Applications

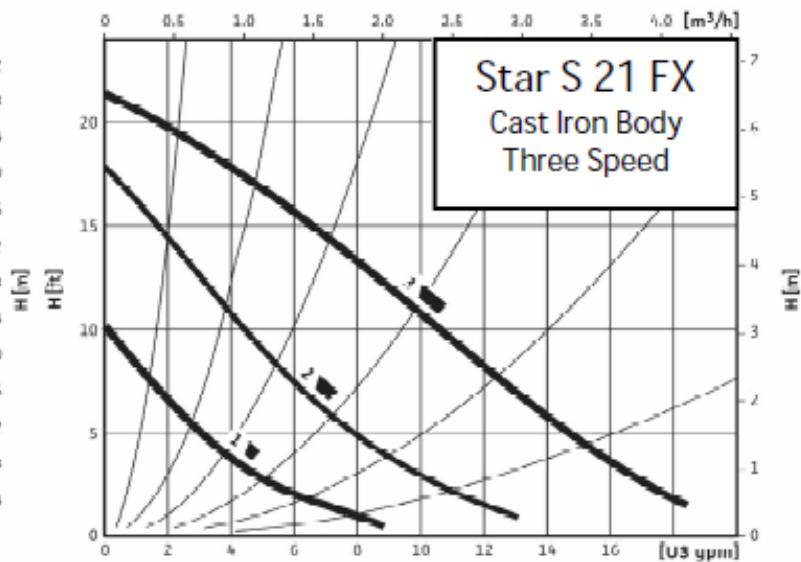
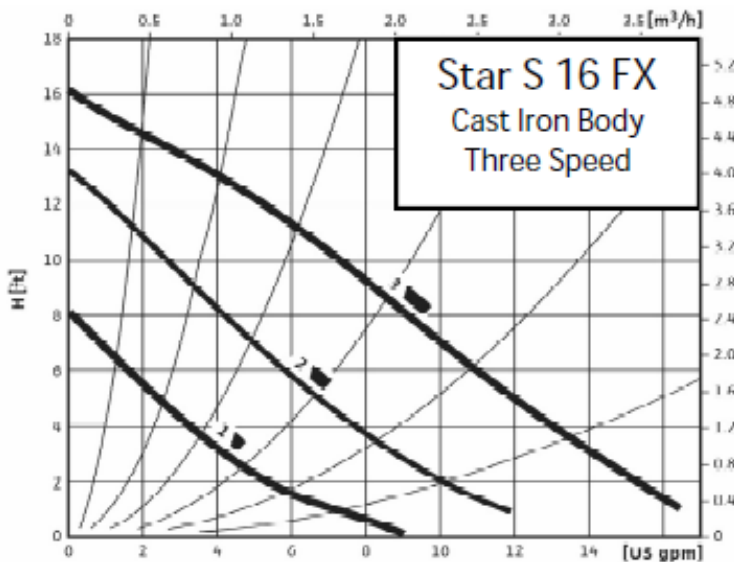
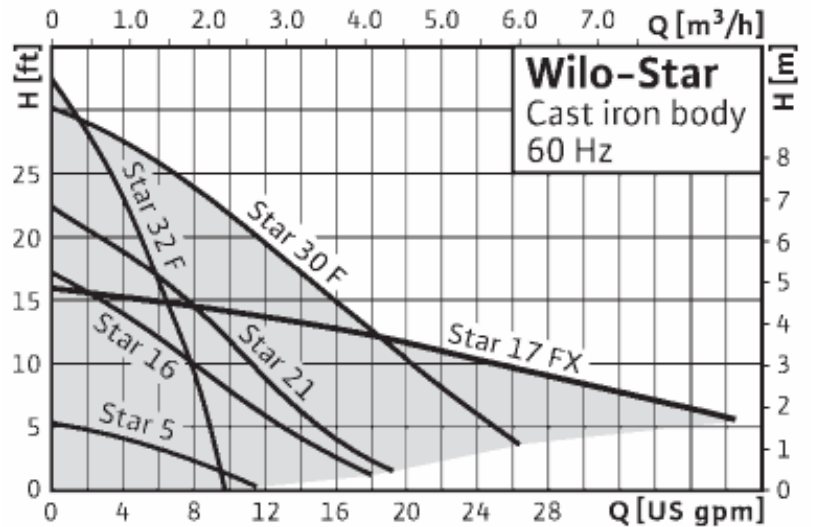
Maximum Temp - 14 to 230 Deg F (- 10 to 110 Deg C)
 Maximum Ambient Temp 104 Deg F (40 Deg C)
 Maximum Working Pressure 140 PSI (10 Bar)

Materials of Construction

Impeller Polypropylene (40% Glass Filled)
 Shaft Stainless Steel (X40 Cr13)
 Bearing Metal Impregnated Carbon
 Volute Cast Iron (Closed Systems)

| | |
|-----------------------|----------|
| 122 deg F (50 deg C) | 0.7 PSI |
| 203 deg F (95 deg C) | 4.4 PSI |
| 230 deg F (110 deg C) | 14.5 PSI |

Min Inlet Pressure



Wilo Canada Inc
 Wilo USA LLC
 Bay 7 - 2915 - 10th Ave N. E.
 Calgary, Alberta, T2A 5L4
 Phone: 1 403 276 WILO Fax: 1 403 277 WILO

Toll Free USA: 1 866 WILO USA
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WILO Star Submittal

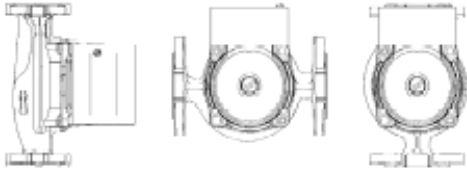
Classic Star - Electrical and Dimensional Info



Pumpen Intelligenz.

Installation Instructions - Shaft Horizontal

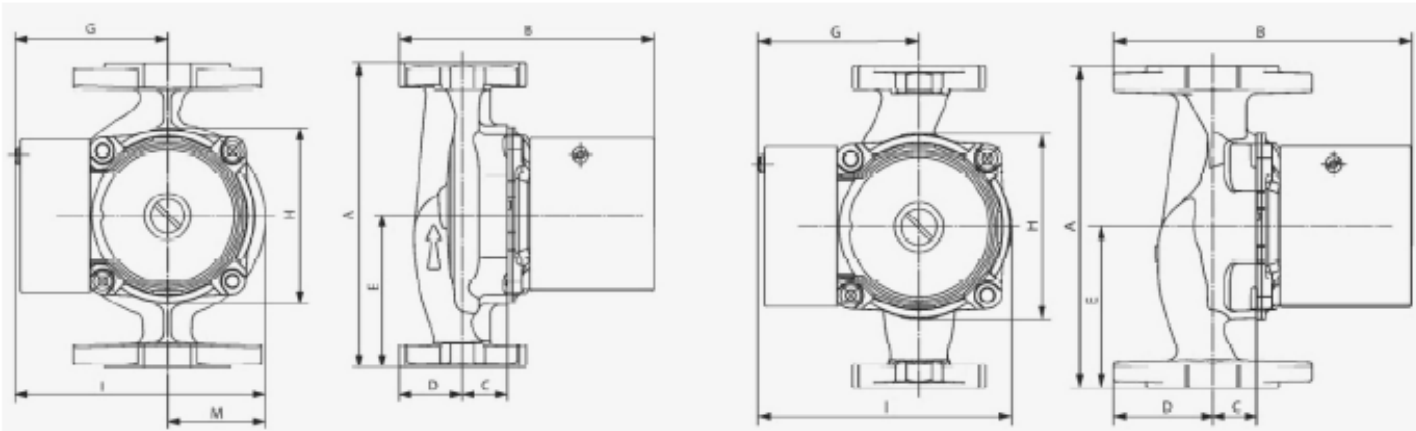
Motor and Electrical Data



| Model (speed) | Rated Power (P2) | Speed | Power Consumption | Amps @ 115/60 | Capacitor (uF) |
|------------------|-------------------|-------|--------------------|---------------|----------------|
| Star 5 FX | 0.03 Hp (20 Watt) | 3400 | 0.07 Hp (50 Watt) | 0.49 | 7 |
| Star 16 FX | 0.05 Hp (35 Watt) | 2700 | 0.11 Hp (80 Watt) | 0.66 | 7 |
| Star 21 FX | 0.05 Hp (40 Watt) | 2700 | 0.15 Hp (110 Watt) | 0.92 | 9 |
| Star 17 | 0.10 Hp (70 Watt) | 3000 | 0.23 Hp (166 Watt) | 0.58 | 7 |
| Star 30 F | 0.10 Hp (70 Watt) | 2700 | 0.24 Hp (173 Watt) | 1.50 | 12 |
| Star 32 F | 0.05 Hp (40 Watt) | 2700 | 0.15 Hp (113 Watt) | 0.92 | 9 |
| Star S 16 FX (3) | 0.05 Hp (35 Watt) | 2700 | 0.10 Hp (80 Watt) | 0.66 | 7 |
| Star S 16 FX (2) | 0.05 Hp (35 Watt) | 2200 | 0.08 Hp (60 Watt) | 0.55 | 7 |
| Star S 16 FX (1) | 0.05 Hp (35 Watt) | 1600 | 0.05 Hp (41 Watt) | 0.38 | 7 |
| Star S 21 FX (3) | 0.05 Hp (40 Watt) | 2700 | 0.13 Hp (110 Watt) | 0.92 | 9 |
| Star S 21 FX (2) | 0.05 Hp (40 Watt) | 2100 | 0.10 Hp (83 Watt) | 0.75 | 9 |
| Star S 21 FX (1) | 0.05 Hp (40 Watt) | 1300 | 0.07 Hp (56 Watt) | 0.56 | 9 |

Star F Series

Star FX Series



Dimensions (inches/mm) - NOTE: Star 17 uses the larger 2 bolt oval flange (commercial type).

| Model | A | B | C | D | E | G | H | I | M | Wt |
|----------------|-------------|-------------|------------|------------|-------------|------------|------------|-------------|------------|--------------|
| Star 5 FX | 6 3/4 (162) | 6 (150) | 3/4 (22) | 2 (50) | 3 3/4 (81) | 3 3/4 (81) | 3 3/4 (94) | 5 (128) | - | 6.5 (3.0 kg) |
| Star (S) 16 FX | 6 3/4 (162) | 6 (150) | 3/4 (22) | 2 (50) | 3 3/4 (81) | 3 3/4 (81) | 3 3/4 (94) | 5 (128) | - | 6.5 (3.0 kg) |
| Star 17 FX | 8 3/4 (216) | 7 (176) | 1 1/4 (33) | 2 1/4 (55) | 4 1/4 (108) | 3 3/4 (82) | 3 3/4 (96) | 5 1/4 (130) | - | 10.8 (4.9) |
| Star (S) 21 FX | 6 3/4 (162) | 6 (150) | 3/4 (22) | 2 (50) | 3 3/4 (81) | 3 3/4 (81) | 3 3/4 (94) | 5 (128) | - | 6.5 (3.0 kg) |
| Star 30 F | 6 3/4 (165) | 6 3/4 (153) | 1 1/4 (31) | 1 1/4 (34) | 3 3/4 (83) | 3 3/4 (81) | 3 3/4 (96) | 5 1/4 (132) | 2 (50) | 8.0 (3.7 kg) |
| Star 32 F | 6 3/4 (162) | 5 3/4 (136) | 3/4 (24) | 1 1/4 (34) | 3 3/4 (81) | 3 3/4 (81) | 3 3/4 (94) | 5 (128) | 2 1/4 (52) | 6.7 (3.1 kg) |

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Literature Number SCISD-0609 (pg 2/2)

UTILITECH 5 GALLON WATER HEATER EXPANSION TANK

[RELATED SECTION 22 33 30.23]

Model Number: LET-5

Location: Main House Mechanical Closet

Dimensions:

Diameter: 11"

Height: 14-3/4"

Finish: blue high UV powder coat

Features:

Capacity: 5 gal

Tank discharge size: 3/4"

Drawdown Gallons @ 20-40 psi: 1.7

Drawdown Gallons @ 30-50 psi: 1.4

Drawdown Gallons @ 40-60 psi: 32.3

Available: Lowes

Price: \$49.00





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[Gift C](#)

Home : Search "let-5" : Utilitech 5-Gallon Expansion Tank



Utilitech 5-Gallon Expansion Tank

Item #: 160682 | Model #:LET-5

★★★★★ [4 reviews](#) | [Write a review](#)

\$49.00

Customers Also Viewed



Utilitech 2 Gallon Expansion Tank

★★★★★
\$39.00



WellSaver 20-Gallon Pump Tank

★★★★★
\$142.00



WellSaver 5-Gallon Pump Tank

★★★★★
\$66.00



Utilitech 7 Gallon Pump Tank

★★★★★
\$88.00



WellSaver 25-Gallon Pressure Tank

★★★★★
\$177.00

[Description](#)

[Specifications](#)

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| | | | |
|------------------------------|---------------------|---|----------------|
| Tank Type | Expansion | Recommended Size (# of Faucets/showers) | N/A |
| Drawdown Gallons @ 30-50 PSI | 1.4 | Height (Inches) | 14.75 |
| Drawdown Gallons @ 40-60 PSI | 32.3 | Diameter (Inches) | 11.0 |
| Color/Finish | High UV powder coat | Pressure Relief Valve | No |
| Color/Finish Family | Blue | Warranty | Limited 1 year |
| Tank Capacity (Gallons) | 5.0 | Drawdown Gallons @ 20-40 PSI | 1.7 |
| Tank Discharge Size (Inches) | 0.75 | | |

TOTO AQUIA II DUAL FLUSH TOILET 10" ROUGH IN

[RELATED SECTION 22 41 13]

Model Number: CST412MF.10

Location: Core Module Bath, Flex Bath

Dimensions:

Length: 27-1/2"

Width: 15-3/8"

Height: 31-1/4"

Finish: 01, Cotton

Features:

Rough In: 10"

Elongated skirted design

Large fully-glazed trapway, 2-1/8"

Concealed trapway bowl

Chrome push-button style dual flush option Minimum water pressure: 8psi

Efficiency:

Meets EPA WaterSense Criteria

Low consumption dual flush toilet

Full Flush: 1.6 gpf

Partial Flush: .9 gpf

Available: Cregger Company: Gateway Center



CST412MF.10

Aquia® Close Coupled Toilet, 1.6GPF & 0.9 GPF

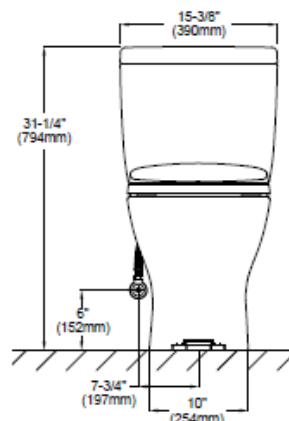
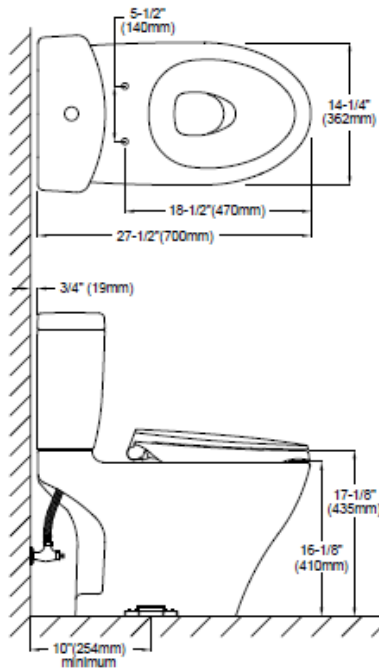
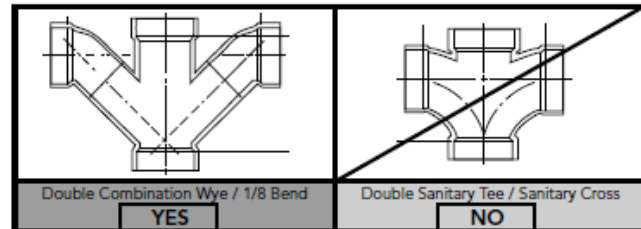
SPECIFICATIONS

- Water Use 1.6 GPF & 0.9GPF (6.0 LPF & 3.4LPF)
- Flush System Dual-Max®
- Min. Water Pressure 8 psi (flowing)
- Water Surface 6" x 4-1/2"
- Trap Diameter 2-1/8"
- Rough-in 10"
- Trap Seal 2-1/8"
- Warranty One Year Limited Warranty
- Material Vitreous china
- Shipping Weight CT412F.10 - 78lbs
ST412M - 30lbs
- Shipping Dimensions CT412F.10
30-3/4" L x 17-3/8" W
x 20-1/2" H

ST412M
17-1/4" L x 7-7/8" W
x 17-1/2" H

INSTALLATION NOTES

Back-to-Back Toilet Installations:
TOTO recommends the use of a nationally listed, double sanitary tee-wye only, in vertical waste stacks, in accordance with the stipulations noted in the majority of nationally recognized plumbing codes.



TOTO®

These dimensions and specifications are subject to change without notice

MOEN CAMELOT DOUBLE BOWL DROP IN SINK**[RELATED SECTION 22 41 16]**

Model Number: 22234

Location: Living Module

Dimensions:

Large Bowl: 14" x 16" x 7"

Small Bowl: 7-1/2" x 16" x 5"

Finish: Stainless Steel

Features:

Rough In: 24-3/4" x 17-7/8" with 3/4" corner radius

Soundshield undercoating maximizes sound deadening and inhibits condensation

Manufactured of 20 gauge, type 301 nickel-bearing stainless steel

Exposed surfaces are polished to a lustrous satin tone finish

Two 3-1/2" diameter recessed drain openings

Includes all necessary mounting hardware

Available: Lowes

Price: \$137.60





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Home : [Search "22234"](#) : Moen Double-Basin Stainless Steel Topmount Kitchen

Sink



Moen Double-Basin Stainless Steel Topmount Kitchen Sink

Item #: 89183 | Model #:22234

★★★★★ Be the first to [write a review!](#)

\$137.60

Customers Also Viewed



Moen 4-Hole Double-Basin Stainless Steel



Moen 4-Hole Double-Basin Stainless Steel



Moen 4-Hole Double-Basin Stainless Steel



Moen 1-Hole Double-Basin Stainless Steel



Elkay 4-Hole Double-Basin Stainless Steel

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|----------------------------|-----------------|--------------------------|-----------------|
| Sink Type | Topmount | Color / Finish | Stainless |
| Number of holes for faucet | 0.0 | Nominal Length (Inches) | 25.0 |
| Soundproof Padding | Yes | Weight (lbs.) | 11.4 |
| Free Item Included | No | Length (Inches) | 25.0 |
| Warranty | 10 Year Limited | Finish Family | Stainless Steel |
| UL Safety Listing | No | Width (Inches) | 18.0 |
| CSA Safety Listing | Yes | Series / Suite | Camelot |
| ETL Safety Listing | No | Number of Basins | 2.0 |
| NSF Safety Listing | No | Depth of Bowl 1 (Inches) | 7.0 |
| Sink Material | Stainless Steel | Depth of Bowl 2 (Inches) | 5.0 |

AVANITY VITREOUS CHINA VESSEL SINK

[RELATED SECTION 22 41 16]

Model Number: CVE460SQ

Location: Core Module Bath

Dimensions:

Length: 18"

Width: 18"

Depth: 6"

Finish: White

Features:

Square shape with rectangular basin

Drain not included

Available: Sears



Avanity

CVE460SQ

Features

- Vitreous China
- Vessel application
- Pre-drilled for single faucet

Colors / Finishes

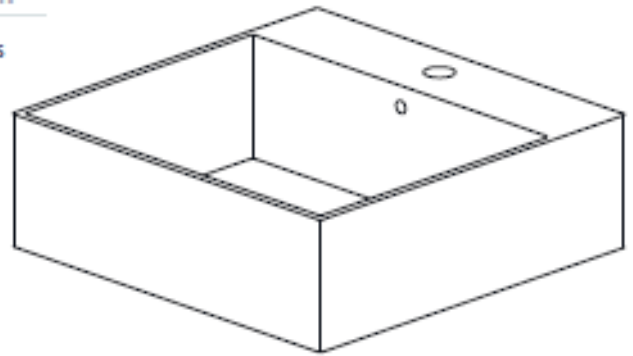
- White

Nominal Dimension

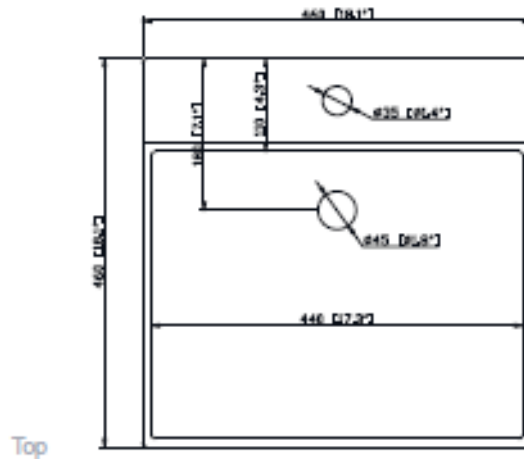
- 18W x 18D x 4H inches
- 450 x 450 x 105 mm

Components

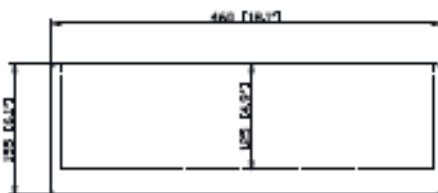
| | | |
|-------|-------------|-------------|
| Drain | VC-DRAIN-CP | VC-DRAIN-BN |
|-------|-------------|-------------|



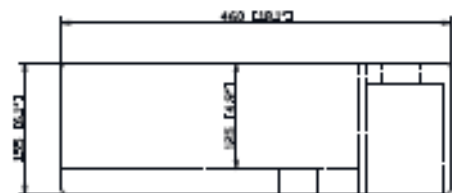
Product Diagrams



Top



Front



Side

OPELLA UNDERMOUNT BAR SINK

[RELATED SECTION 22 41 16]

Model Number: 13200.045

Location: Outdoor Kitchen

Dimensions:

Length: 13"

Width: 10"

Depth: 5-1/8"

Finish: Brushed Stainless Steel

Features:

Undermount or Drop-In

18 gauge stainless steel

3-1/2" Drain Opening

Requires 3-1/2" kitchen basket strainer

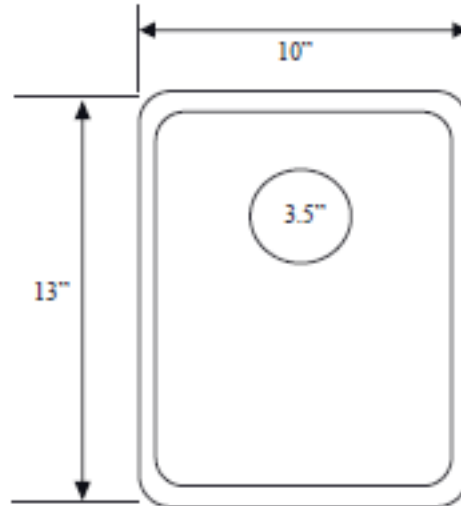
Available: Holliday Sales



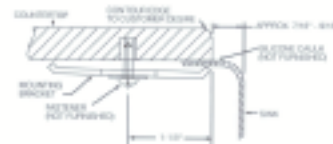


Opella, LLC
 2701 Vista Parkway, Suite A-7
 West Palm Beach, FL 33411
 (772) 919-7905 Fax: (561) 640-3586

**Product
 Specification/Cut Sheet**
13200.xxx - Rectangle Bar Sink



The following guideline provides the only type of installation recommended by Opella, LLC.



Rectangle Bar Sink

Opella Model # 13200.xxx

- Length: 13"
- Width: 10"
- Depth: 5-1/8"
- 18/8.5 Stainless Steel
- 3-1/2" Drain Opening
- Undermount or Drop-In

DIMENSIONS

- Length: 13"
- Width: 10"
- Depth: 5-1/8"

CARE AND CLEANING:

Care should be given to the cleaning of this product. While its finish is extremely durable, it can be damaged by harsh abrasives or polish. To clean, simply wipe gently with a damp cloth and blot dry with a soft towel.

NOTE: Dimensions may vary +/-1/2" and are subject to change or cancellation.

Primary dimensions are provided in Imperial measurements, transposition to millimeters is the sole responsibility of the installer. Dimensions for Location of Supply are Suggested.

Opella, LLC assumes no responsibility or liability for local or state regulations which deviate from national standards. It shall be the responsibility of the installer to comply with local codes and standards prior to installation of any Opella product.

DELTA ARZO SHOWERHEAD

[RELATED SECTION 22 41 23]

Model Number: 57740-SS

Location: Core Module Bath and Outdoor Shower

Dimensions:

8"x 8" Spray Face

Finish: Stainless Steel

Features:

Touch-Clean Showerhead

1.5 gpm @ 80 psi

Number of Spray Patterns: 1

Available: Lowes

Price: \$286.07



Home : [Search "57740-ss"](#) : Delta Stainless Steel Arzo Showerhead



Delta Stainless Steel Arzo Showerhead






Item #: 89235 | Model #:57740-SS

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\$286.07

Nobody beats our prices. **NOBODY.**

Customers Also Viewed

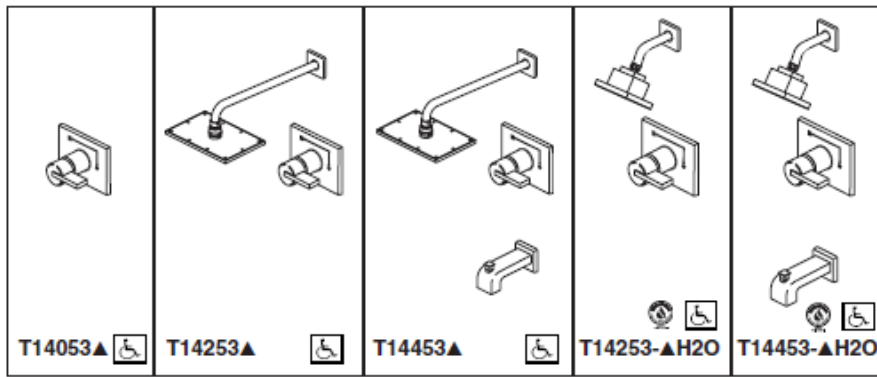
| | | | | |
|---|---|---|--|---|
|  |  |  |  |  |
| Delta Chrome Arzo Showerhead \$211.90 | Delta Chrome Showerhead \$55.60 | American Standard Polished Chrome Showerhead \$112.00 | Delta Arzo Chrome 1-Handle Shower Faucet Trim... \$164.03 | Moen Chrome Touch Control Adler Showerhead \$38.98 |

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Protection Plans](#) | [Reviews](#) | [Q&A](#)

| | | | |
|-------------------------|---------------------|--------------------------|------|
| Faucet Finish | Stainless Steel | Series / Suite | Arzo |
| Faucet/Fixture Material | Brass/Plastic | Self-Cleaning Nozzles | No |
| Finish Family | Steel-Stainless | Number of Spray Patterns | 1.0 |
| Style | Standard Showerhead | | |



TUB AND SHOWER FAUCET TRIM



Submitted Model No.: _____
 Specific Features: _____

- **Vero Series**
- **Valve Only Trim (T14053)**
- **Shower Only Trim (T14253)**
- **Tub/Shower Trim - Pull-Up Tub Spout (T14453)**
- **Single Handle**

STANDARD SPECIFICATIONS:

- Monitor® 14 Series pressure balanced bath mixing valve with Scald-Guard®.
- Maintains a balanced pressure of hot and cold water even when a valve is turned on or off elsewhere in the system.
- For use with MultiChoice® Universal rough valve body. (R10000 Series)
- Lever handle.
- Field adjustable to limit handle rotation into hot water zone.
- 120° maximum handle rotation.
- All parts replaceable from the front of the valve.
- **Note:** Product will be marked with flow rate of specific showerhead.

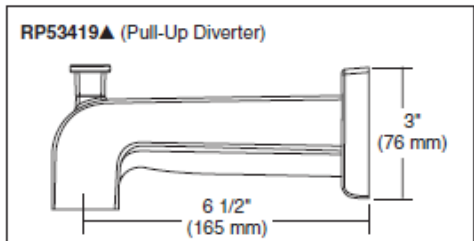
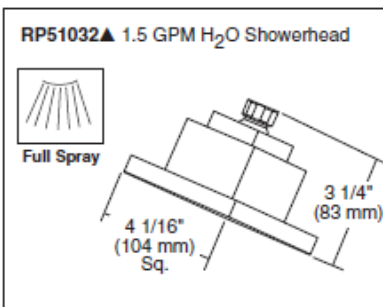
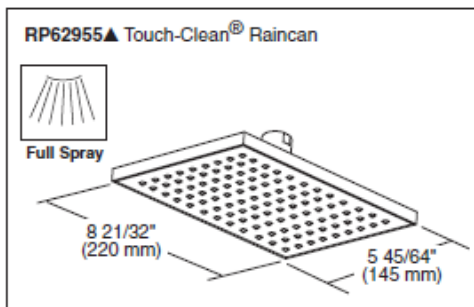
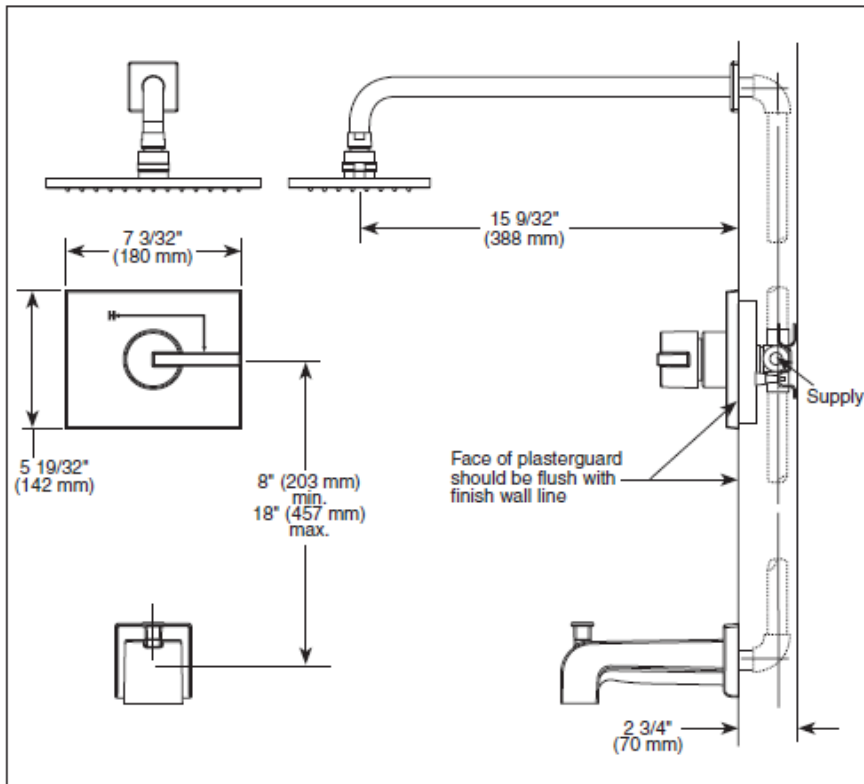
WARRANTY

- Lifetime Faucet and Finish Limited Warranty to the original consumer purchaser to be free from defects in material and workmanship.
- 5 Year Limited Warranty for usage in all industrial, commercial and business applications.

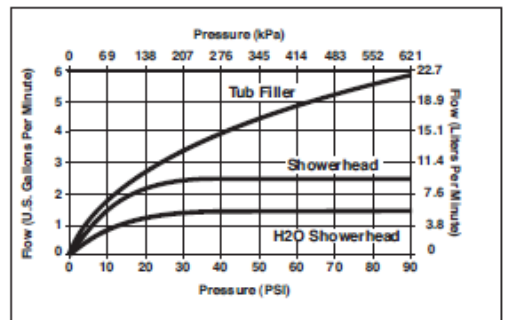


COMPLIES WITH:

- ASME A112.18.1 / CSA B125.1
- ASSE 1016
- Indicates compliance to ICC/ANSI A17.1
- EPA WaterSense (**H₂O models only**)



▲ Designate Proper Finish Suffix



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DELTA MULTICHOICE VALVE

[RELATED SECTION 22 41 23]

Model Number: R10000-UNBX

Location: Core Module Bath, Outdoor Shower

Features:

- 1/2" Inlet

- Ability to set and maintain precise temperature

- Factory-calibrated comfort setting at 104°F

- High temperature safety stop ensures that water temperature

- Does not exceed 120°F

Available: Lowes

Price: \$27.36





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Home : Search "r10000-unbx" : Delta MultiChoice Universal Tub/Shower Valve Body Rough-In



Delta MultiChoice Universal Tub/Shower Valve Body Rough-In

Item #: 250516 | Model #:R10000-UNBX

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\$27.36

Customers Also Viewed



Delta MultiChoice Universal Tub/Shower Valve...

Not Yet Rated

\$38.34



Delta MultiChoice Universal Tub/Shower Valve...

Not Yet Rated

\$38.34



Delta Oil-Rubbed Bronze 1-Handle Shower...

★★★★★

\$94.49



Delta Classic Chrome 1-Handle Shower Faucet...

★★★★★

\$37.61



Delta Oil-Rubbed Bronze 1-Handle Tub & Shower...

★★★★★

\$109.85

Description

Specifications

Info & Guides

Reviews

Q&A

Type

Tub/Shower rough-in



MULTICHOICE® UNIVERSAL ROUGH VALVE BODY

- R10000-UN
- R10000-UNBX
- R10000-UNBXT
- R10000-UNWS
- R10000-PX
- R10000-PXWS
- R10000-IP
- R10000-IPWS
- R10000-MF
- R10000-MFWS
- R10000-UNBXHF
- R10000-UNWSHF
- R10000-UNWSBXT

STANDARD SPECIFICATIONS:

- Forged brass body.
- Back-to-Back installation capabilities.
- Can be tested with air (200 PSI) or water (300 PSI) without valve using supplied test cap.
- Square plasterguard allows for right angle cuts.
- Thin wall mounting.
- For use with Multi Choice™ Universal single or dual function trim. Cartridge ships with trim.

Note: No tub outlet in HF model.

Note: Should use proper fitting with each type (copper tubing, iron pipe, and pex fitting).

Note: Should use proper tooling with crimping pex fitting and cold expansion pex models.

WARRANTY

- Lifetime Faucet and Finish Limited Warranty to the original consumer purchaser to be free from defects in material and workmanship.
- 5 Year Limited Warranty for usage in all industrial, commercial and business applications.

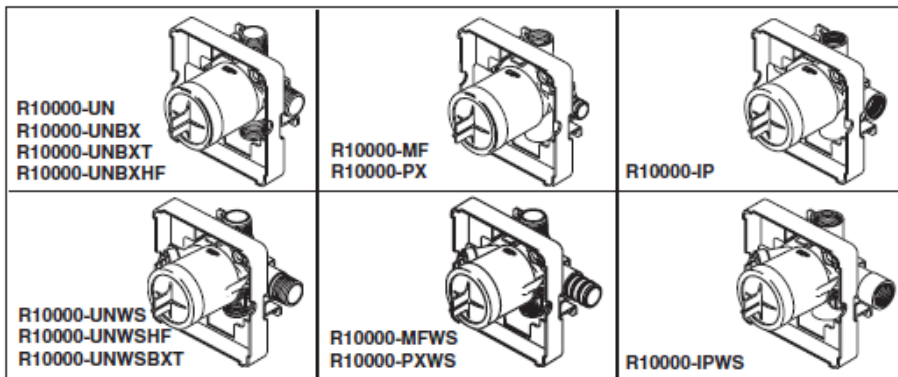


COMPLIES WITH:

- ASME A112.18.1 / CSA B125.1

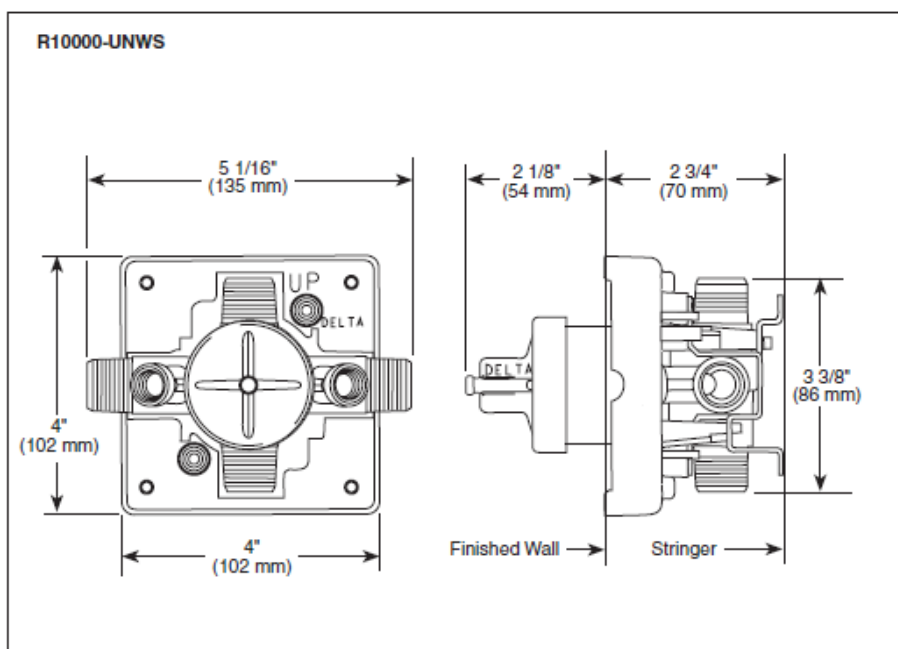
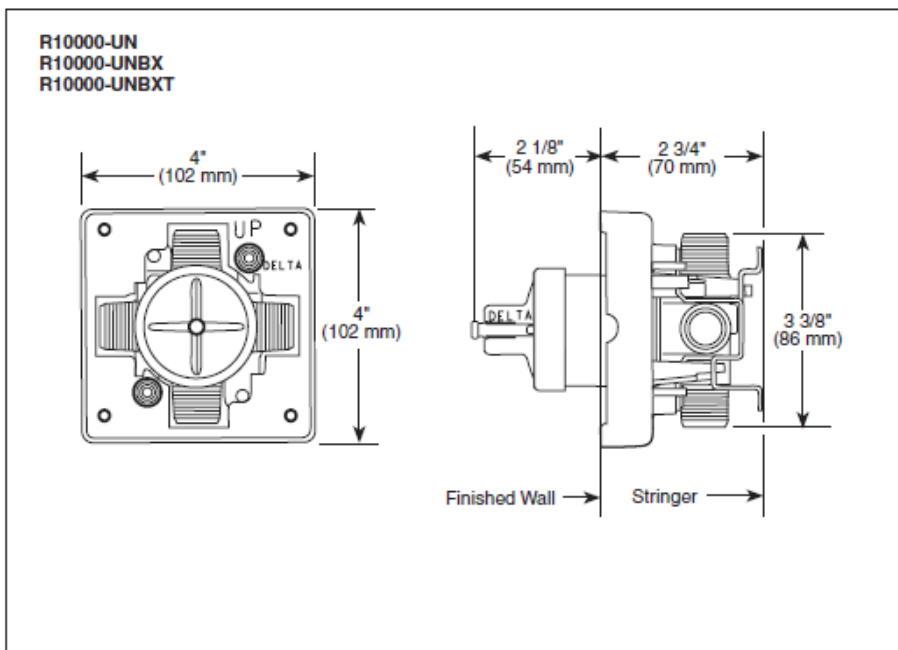


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Submitted Model No.: _____

Specific Features: _____



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DELTA SHOWER TRIM KIT

[RELATED SECTION 22 41 23]

Model Number: T14053-SS

Location: Core Module Bath, Flex Bath

Dimensions:

Length: 7"

Height: 5-1/2"

Finish: Stainless Steel

Features:

Number of Faucet Handles: 1

Handle Type: Lever

Pressure Balanced

Scaled Guard

Connection Type: IPS

Flow Rate: 1.5, 2.5 gallons per minute

Available: Lowes





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Home : [Search "t14053-ss"](#) : [Delta Monitor\(R\) 14 Series Tub and Shower Valve](#)

[Trim For Delta Faucets](#)



Delta Monitor(R) 14 Series Tub and Shower Valve Trim For Delta Faucets

Item #: 89235 | Model #:T14053-SS

★★★★★ [Be the first to write a review!](#)

\$159.95

Trim kit only, must purchase rough-in separately

Customers Also Viewed



[Delta MultiChoice Universal Tub/Shower Valve...](#)

Not Yet Rated

\$38.34



[Delta Vero Stainless 1-Handle Shower Faucet...](#)

Not Yet Rated

\$263.75



[Delta Monitor\(R\) 14 Series Tub and Shower...](#)

Not Yet Rated

\$56.55



[Delta Arzo Chrome 1-Handle Shower Faucet Trim...](#)

★★★★★

\$164.03



[Delta Stainless Steel Traditional 5-Spray...](#)

Not Yet Rated

\$126.16

[Description](#)

[Specifications](#)

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[Q&A](#)

Application

Tub/Shower

Fits Faucet Brands/Models

Delta

Finish Family

Steel-stainless

Package Contents

Pressure balance valve, lever handle, escutcheon, maintenance & installation instructions

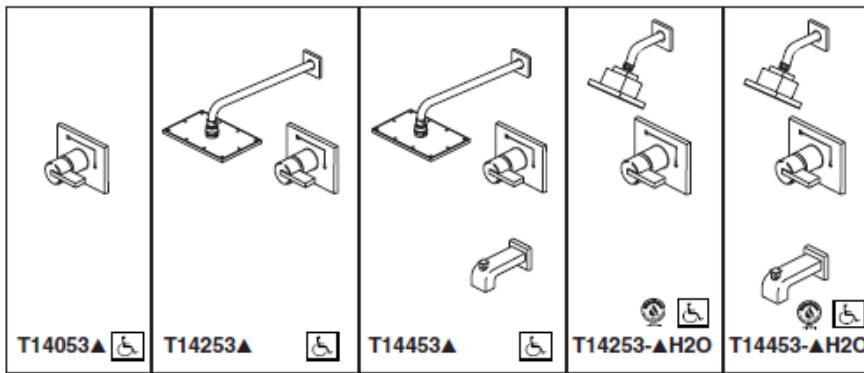
Package Quantity

1.0



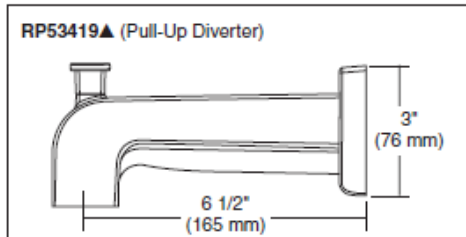
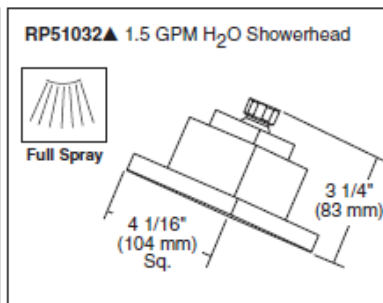
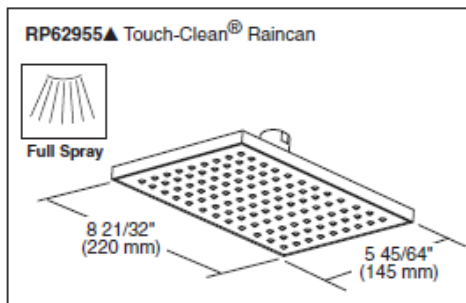
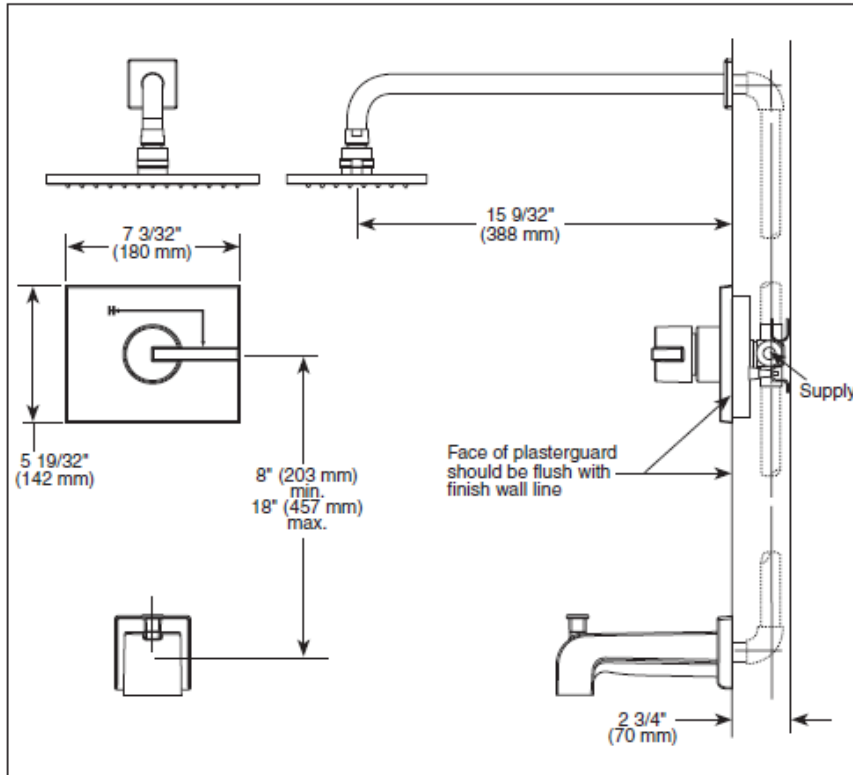
TUB AND SHOWER FAUCET TRIM

- Vero Series
- Valve Only Trim (T14053)
- Shower Only Trim (T14253)
- Tub/Shower Trim - Pull-Up Tub Spout (T14453)
- Single Handle



Submitted Model No.: _____

Specific Features: _____



▲ Designate Proper Finish Suffix

STANDARD SPECIFICATIONS:

- Monitor® 14 Series pressure balanced bath mixing valve with Scald-Guard®.
- Maintains a balanced pressure of hot and cold water even when a valve is turned on or off elsewhere in the system.
- For use with MultiChoice® Universal rough valve body. (R10000 Series)
- Lever handle.
- Field adjustable to limit handle rotation into hot water zone.
- 120° maximum handle rotation.
- All parts replaceable from the front of the valve.
- **Note:** Product will be marked with flow rate of specific showerhead.

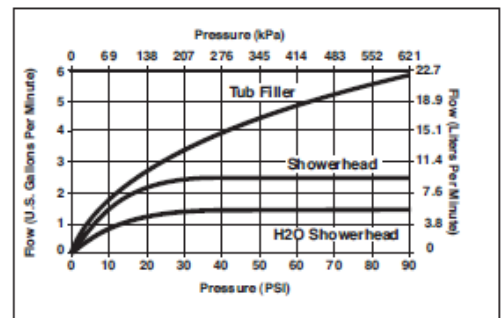
WARRANTY

- Lifetime Faucet and Finish Limited Warranty to the original consumer purchaser to be free from defects in material and workmanship.
- 5 Year Limited Warranty for usage in all industrial, commercial and business applications.



COMPLIES WITH:

- ASME A112.18.1 / CSA B125.1
- ASSE 1016
- Indicates compliance to ICC/ANSI A117.1
- EPA WaterSense (**H₂O models only**)



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DELTA KITCHEN FAUCET

[RELATED SECTION 22 41 39]

Model Number: 185LF-SS

Location: Core Module Bath

Dimensions:

Length: 8-1/4"

Height: 7"

Finish: Stainless Steel

Features:

1 Faucet Handle

Standard Spout swivels 360 degrees

Available: Lowes

Price: \$189.89





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Home : [Search "185lf-66"](#) : [Delta Grail Stainless 1-Handle High-Arc Kitchen Faucet](#)



Delta Grail Stainless 1-Handle High-Arc Kitchen Faucet

Item #: 89235 | Model #:185LF-66

★★★★★ [Be the first to write a review!](#)

\$189.89

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Customers Also Viewed...



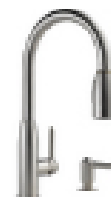
[Delta Grail Chrome 1-Handle High-Arc Kitchen...](#)
\$140.63



[Delta Grail Stainless 1-Handle Pull-Down...](#)
\$316.47



[Delta Talbot Stainless 1-Handle Pull-Down...](#)
\$258.00



[Peerless 1-Handle Kitchen Faucet](#)
\$98.00
Was: \$138.00
(Save 28% through 08/20/2011)



[Delta Traditional Stainless 1-Handle Pull-Out...](#)
\$188.00

[Description](#)

[Specifications](#)

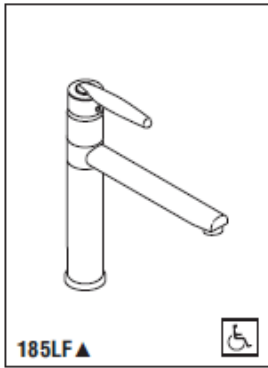
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[Protection Plans](#)

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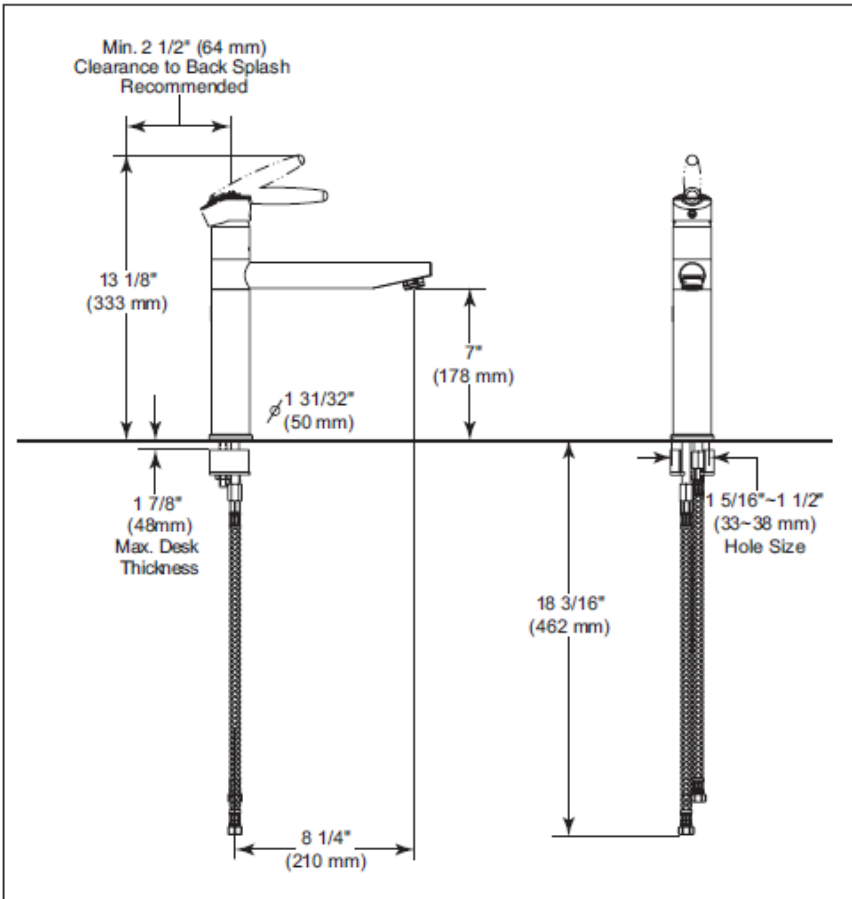
[Q&A](#)

| | | | |
|---------------------------------|----------|-----------------------|-----------------|
| Spray Type | None | Spout Height (Inches) | 7.0 |
| Soap or Lotion Dispenser | No | ADA Approved | Yes |
| Spray and Stream | No | Built-in Water Filter | No |
| Number of Faucet Handles | 1-handle | Faucet Finish | Stainless Steel |
| Maximum Deck Thickness (Inches) | 1.0 | Series / Suite | Grail |



Submitted Model No.: _____

Specific Features: _____



▲ Designate proper finish suffix



KITCHEN FAUCETS

- Grail® Series
- Single Handle Deck Mount
- 1 Hole Sink Applications

STANDARD SPECIFICATIONS:

- Ceramic cartridge.
- 1 hole installation.
- 8 1/4" (210 mm) long, 7" (178 mm) high reach on spout, swings 360°.
- Maximum 1 7/8" (48 mm) deck thickness.
- Colour coded plug button on handle for hot/cold identification.

WARRANTY

- Lifetime Faucet and Finish Limited Warranty to the original consumer purchaser to be free from defects in material and workmanship.
- 5 Year Limited Warranty for usage in all industrial, commercial and business applications.



COMPLIES WITH

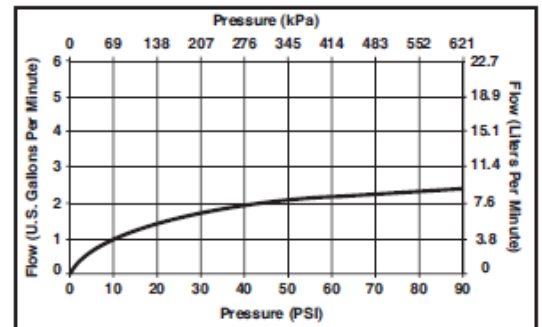
- ASME A112.18.1 / CSA B125.1
- NSF 61



Indicates compliance to ICC / ANSI A117.1

- CSA Certified

Verified compliant with 0.25% weighted average Pb content regulations.



DELTA BAR FAUCET

[RELATED SECTION 22 41 39]

Model Number: 1903-SS-DST

Location: Outdoor Kitchen

Dimensions:

Length: 5"

Height: 10"

Weight: 5lbs

Finish: Stainless Steel

Features:

2-Hole 4" Installation

High Arc spout swivels 180 degrees

Lever Handle

3/8" Compression fittings

2 1/2" maximum deck thickness

32" minimum supply lines below deck included

1.5 gpm @ 60 psi

Available: Lowes

Price: \$137.55





Home : Search "1903-ss-dst" : Delta Classic Stainless Steel 1-Handle Bar Faucet



Delta Classic Stainless Steel 1-Handle Bar Faucet

Item #: 89235 | Model #: 1903-SS-DST

★★★★★ Be the first to [write a review!](#)

\$137.55

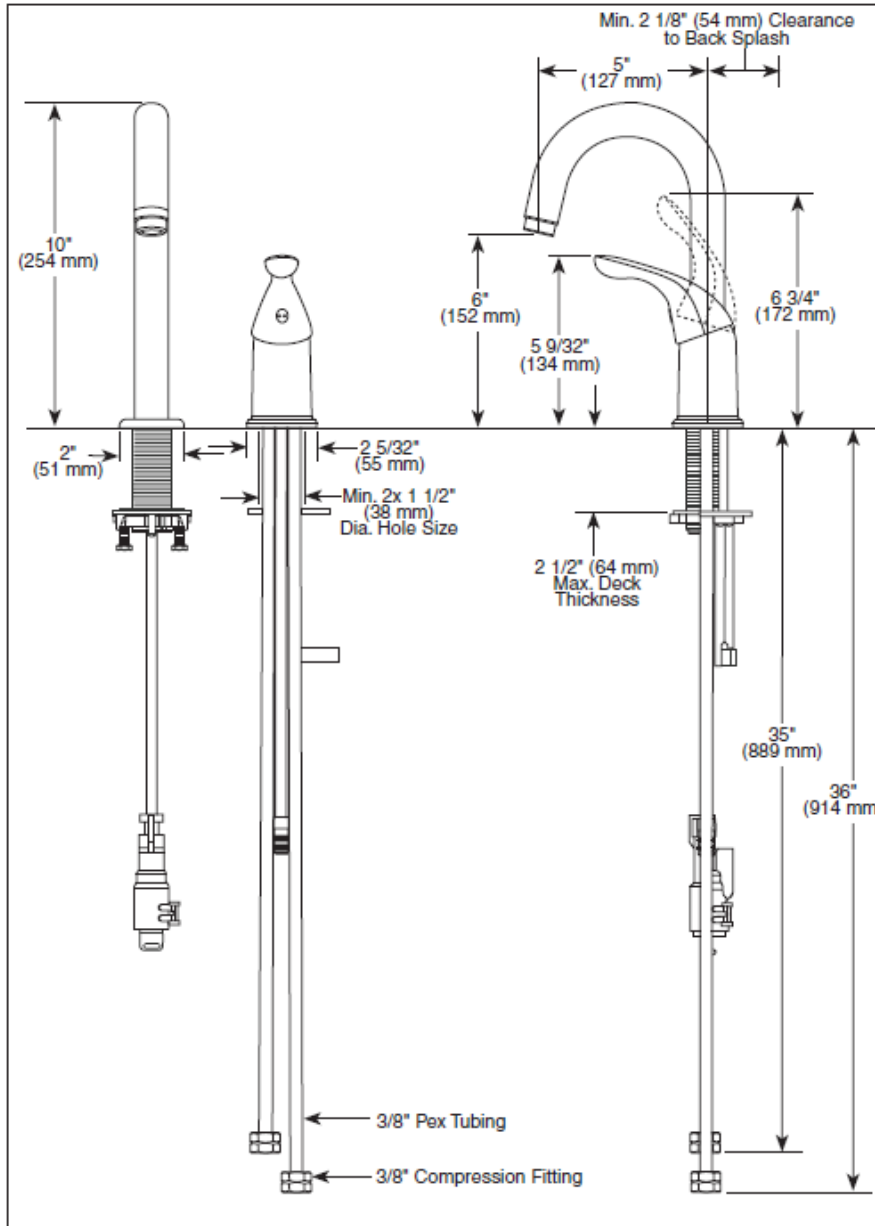
[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|--|--|------------------------------|--------------|
| Color/Finish Family | Steel-Stainless | Supply Lines Included | Yes |
| Base Warranty Labor (Months) | 0.0 | ADA Compliant | Yes |
| Items Required for Standard Installation | Protective eyewear, plumber's tape, adjustable wrench, screwdriver | Dispense Temperature | Hot and cold |
| Deck Plate Included | No | Collection Name | Classic |
| 1-Hole Sink Compatible | No | Number of Faucet Handles | 1-handle |
| 2-Hole Sink Compatible | Yes | Handle Type | Lever |
| 3-Hole Sink Compatible | No | Side Spray Included | No |
| CA and VT Low-Lead Standards Compliant | Yes | Soap or Lotion Dispenser | No |
| Maximum Deck Thickness (Inches) | 2.0 | Built-In Water Filter | No |
| Manufacturer Color/Finish | Stainless | Base Warranty Parts (Months) | 9999.0 |



Submitted Model No.: _____

Specific Features: _____



▲ Designate proper finish suffix



BAR & PREP SINK FAUCETS

- Classic Series
- Single Handle Widespread Deck Mount
- Two Hole Sink Applications
- Pex® Hose Installation

STANDARD SPECIFICATIONS:

- Solid fabricated brass body.
- 5" (127 mm) long, 10" (254 mm) high spout swings 180°.
- Lever handle shall return to neutral position when faucet is turned off.
- Red and blue button on handle to indicate hot/cold temperature.
- Control mechanism shall be the diamond coated ceramic cartridge.
- Pex® hose installation.
- 3/8" O.D. straight, staggered pex supply tubes - 35" (889 mm) and 36" (914 mm) long - with 3/8" compression fittings.
- Thick deck mounting kit for 3 1/2" (89 mm) max. deck thickness available as RP37775.
- Maximum flow rate of 1.5 gpm @ 60 PSI.

WARRANTY

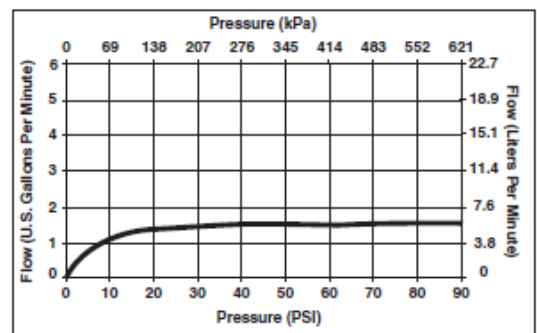
- Lifetime Faucet and Finish Limited Warranty to the original consumer purchaser to be free from defects in material and workmanship.
- 5 Year Limited Warranty for usage in all industrial, commercial and business applications.



COMPLIES WITH:

- ASME A112.18.1 / CSA B125.1
- NSF 61

Indicates compliance to ICC/ANSI A117.1



55 E. 111th Street, Indianapolis, Indiana 46280
 395 Matheson Blvd. E., Mississauga, ON L4Z 2H2
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Delta reserves the right (1) to make changes in specifications and materials, and (2) to change or discontinue models, both without notice or obligation. Dimensions are for reference only. See current full-line price book or www.specselect.com for finish options and product availability.

PRICE PFISTER SKYE BATHROOM FAUCET

[RELATED SECTION 22 41 39]

Model Number: F-46-SYKK

Location: Flex Bath

Finish: Brushed Nickel

Features:

Ceramic disc valving for leak-free operation

High-arc spout for added clearance

Connection Type: Threaded pipe

Mounting Centers: 4"Centerset

Single Handle Lever

3 Holes for Installation

Efficiency:

WaterSense Labeled- Uses 30% less water

Available: Lowes

Price: \$128





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Home : [Search "skye bathroom faucet"](#) : [Price Pfister Skye Brushed Nickel 2-Handle WaterSense Bathroom Faucet \(Drain Included\)](#)



Price Pfister Skye Brushed Nickel 2-Handle WaterSense Bathroom Faucet (Drain Included)

Item #: 290884 | Model #:F-46-SYKK

★★★★★ 5 reviews | [Write a review](#)

\$128.00

Customers Also Viewed



AquaSource
Brushed Nickel
2-Handle
Bathroom...
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\$157.98



Price Pfister Selia
Brushed Nickel
2-Handle...
★★★★★
\$88.00



Price Pfister Selia
Brushed Nickel
2-Handle...
★★★★★
\$118.00



allen + roth 24"
Rustic Oak Foley
Bath Vanity...
★★★★★
\$199.00

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|-----------------------|-------------------|--------------------------|----------|
| Mounting Centers | 4" Centerset | Series / Suite | Skye |
| Drain Included | Yes | Number of Faucet Handles | 2-handle |
| Spout Reach (Inches) | 4.68 | Handle Type | Lever |
| Spout Height (Inches) | 6.56 | Pulldown Sprayer | No |
| Faucet Finish | Brushed Nickel | Soap or Lotion Dispenser | No |

Highlights

- Meets EPA Watersense Certification 1.5gpm, 5.7L/Min
- Pforever Warranty®

Code Compliance

Price Pfister products are designed and manufactured in compliance with the following standards and codes:

- IAPMO certified
- ASME A112.18.1
- CSA B125 certified
- ANSI A117.1 (Lever handles only)

42 Series

Skye™

Single Control Lavatory Faucet

Single Control

1 or 3-Hole Installation

1/4 Turn Ceramic Disc Valves

Finishes

- Polished Chrome
- Brushed Nickel

F-042-SYCC
F-042-SYKK

x
x

Features

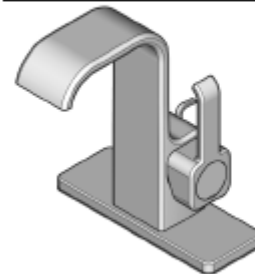
- 1 or 3-Hole Installation; Deck Plate or Single Hole Mounting Option
- Install With or Without Deck Plate
- Lead Free Compliant
- Meets EPA Watersense Certification 1.5gpm, 5.7L/Min
- 1/4 Turn Ceramic Disc Valves
- Step-By-Step Installation Instructions
- Pforever Warranty®

F-042-SYCC
F-042-SYKK

x x
x x
x x
x x
x x
x x
x x



F-042-SYCC
F-042-SYKK



SKUs beginning with F are certified to NSF 61/9 Annex G Low Lead Requirements and are watersense compliant.

For additional information, please contact your Price Pfister representative, or visit our website at www.pricepfister.com.

Project: _____

Contractor: _____

SS-042-SY-1

1-800-PFAUCET www.pricepfister.com
19701 DaVinci, Lake Forest, CA 92610
08/10/10

Price Pfister®

AQUASOURCE PULL-DOWN KITCHEN FAUCET

[RELATED SECTION 22 41 39]

Model Number: 406208233

Location: Living Module

Dimensions:

Length: 10-7/8"

Width: 7-1/4"

Height: 2-1/4"

Finish: Stainless Steel

Features:

Dual control pull down spray head with "quick clean" rubber nozzles

Stainless steel braided flexible supply hoses for installation

High arc provides superior clearance

Fits sinks with 1, 2, 3, or 4 holes

Available: Lowes





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Home : [Search "406208233"](#) : AquaSource Stainless Steel 1-Handle Pull-Down Kitchen Faucet



AquaSource Stainless Steel 1-Handle Pull-Down Kitchen Faucet

Item #: 15445 | Model #:406208233

★★★★★ [11 reviews](#) | [Write a review](#)

\$198.00

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|---------------------------------|-----------|--|------------------------------------|
| Faucet Type | Pull-down | 4-Hole Sink Compatible | Yes |
| Base Warranty Parts (Months) | 120.0 | Maximum Flow Rate (GPM) | 2.2 |
| Base Warranty Labor (Months) | 120.0 | CA and VT Low-Lead Standards Compliant | Yes |
| Spray and Stream | Yes | Handle Type | Lever |
| Supply Lines Included | Yes | Items Required for Standard Installation | Plumber's putty, adjustable wrench |
| Deck Plate Included | Yes | ADA Compliant | Yes |
| Maximum Deck Thickness (Inches) | 1.8 | Built-In Water Filter | No |
| Spout Height (Inches) | 20.0 | Mounting Location | Sink/counter mount |
| Side Spray Included | No | Color/Finish Family | Steel-Stainless |
| 1-Hole Sink Compatible | Yes | Manufacturer Color/Finish | Stainless Steel |
| 2-Hole Sink Compatible | Yes | Collection Name | AquaSource Faucets |
| Number of Faucet Handles | 1-handle | Soap or Lotion Dispenser | Yes |
| 3-Hole Sink Compatible | Yes | | |

DIVISION 23 **HEATING,
VENTILATION, AND
AIR CONDITIONING**

VAISALA INTERCAP HUMIDITY AND TEMPERATURE PROBE

[RELATED SECTION 23 09 13.23]

Model Number: HMP60

Location: HVAC Compartment and South Hall

Dimensions:

Diameter: 1/2" [12 mm]

Length: 2-7/5" [71 mm]

Features:

Temperature measurement range: -40° C to +60°C with accuracy of $\pm 0.6^{\circ}\text{C}$

Relative humidity [RH] measurement range: 0 to 100% RH

Cable length: 15'

Available: Vaisala



Product offering

- > Automatic Weather Stations
- > Aviation Weather Systems
- > Carbon Dioxide
- > Ceilometers
- > Data Loggers
- > Dew Point
- > Distance Measurement
- > Highway Advisory Radio
- > Humidity
 - > HMT330
 - > HMT360
 - > HMT310
 - > HMT120/130
 - > HMD/W60/70
 - > HMW80
 - > HMD40/50
 - > HMT300TMK
 - > HM44
 - > HM70
 - > HMI41
 - > HMP155
 - > OEM Modules
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- > Wind Measurement Systems
- > Wind Sensors
- > Windprofilers

Home > Products > Humidity > Vaisala INTERCAP® Humidity and Temperature Probe HMP60

Vaisala INTERCAP® Humidity and Temperature Probe HMP60

- Overview **Technical Specifications** Services Documents

Technical Specifications

Relative humidity measurement

| | |
|-------------------|----------------|
| Measurement range | 0 ... 100 % RH |
| Accuracy | |
| Temperature range | 0 ... +40°C |
| 0 ... 90 %RH | ±3 %RH |
| 90 ... 100 %RH | ±5 % RH |

For other temperatures, please see the brochure

Humidity sensor Vaisala INTERCAP®

Temperature measurement

| | |
|---------------------------------|----------------|
| Measurement range | -40 ... +60 °C |
| Accuracy over temperature range | |
| -40 ... +60 °C | ±0.6 °C |

Operating environment

| | |
|-----------------------|----------------|
| Operating temperature | -40 ... +60 °C |
|-----------------------|----------------|

Inputs and outputs

| | |
|------------------------------------|---|
| Operating voltage | 5 ... 28 VDC / 8 ... 28 VDC with 5V output |
| | 8 ... 28 VDC with loop power converter |
| Current consumption | 1 mA average, max peak 5 mA |
| Start-up time at operating voltage | 13.5 ... 16.5V: 4s |
| Other supply voltages | 2.5s |
| Outputs | 0 ... 1 VDC/0 ... 2.5 VDC / 0 ... 5 VDC/1 ... 5 VDC |
| 2 channels | |

1 channel loop-power converter (separate module, compatible with humidity accuracy only) digital output (optional)




Mechanics

| | |
|-------------------------|---------------------------|
| Materials | |
| body | chrome coated aluminum |
| grid filter | chrome coated ABS plastic |
| cable | polyurethane or FEP |
| Housing classification | IP65 |
| Body thread | M12x1 / 10 mm |
| Cable connector | 4-pin M8 (IEC 60947-5-2) |
| Weight with 0.3 m cable | 23 g |






For complete specifications, please see the brochure or user guide in "Documents".



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Vaisala INTERCAP® Humidity and Temperature Probe HMP60



The HMP60 for extreme conditions.

Features/Benefits

- Miniature-size humidity probe
- Low power consumption
- Measurement range: 0 ... 100 %RH; -40 ... +60°C
- Cable detachable with standard M8 connector
- Rugged metal housing
- Interchangeable Vaisala INTERCAP® Sensor
- Optional RS485 digital output
- Optional dew point output
- Applications: volume applications, integration into other manufacturers' equipment, glove boxes, greenhouses, fermentation chambers, data loggers

HMP60

The HMP60 is a simple, durable and cost-effective humidity probe. It is suitable for volume applications, integration into other manufacturers' equipment, incubators, glove boxes, greenhouses, fermentation chambers, and data loggers.

Easy installation

The probe cable has a screw-on quick connector for easy installation. Different cable lengths are available. Also other compatible M8 series cables can be used. Accessories are available for different installation needs.

Low current consumption

The HMP60 is suitable for battery-powered applications because of its very low current consumption.

Several outputs

There are two configurable voltage outputs with relative humidity, temperature or dew point scaling. Four voltage output ranges are available.

Rugged design

The HMP60 is designed for extreme conditions. The aluminum body of the HMP60 is classified as IP65. The probe has a sealed structure and the sensor is protected by a membrane filter and a plastic grid, or optionally by a stainless steel filter.

Recalibration not needed

The Vaisala INTERCAP® Sensor is interchangeable. No recalibration is required; the sensor can simply be replaced, also in the field.

Technical data

Performance

| | |
|--|------------------------------|
| RELATIVE HUMIDITY | |
| Measurement range | 0 ... 100 %RH |
| Typical accuracy | |
| temperature range | 0 ... +40 °C |
| 0 ... 90 %RH | ±3 %RH |
| 90 ... 100 %RH | ±5 %RH |
| temperature range | -40 ... 0 °C, +40 ... +60 °C |
| 0 ... 90 %RH | ±5 %RH |
| 90 ... 100 %RH | ±7 %RH |
| Humidity sensor | Vaisala INTERCAP® |
| TEMPERATURE | |
| Measurement range | -40 ... +60 °C |
| Accuracy over temperature range -40 ... +60 °C | ±0.6 °C |
| DEW POINT | |
| Measurement range | -40 ... +60 °C |
| Typical accuracy | |
| temperature range | 0 ... +40 °C |
| when dew point depression < 15 °C | ±2 °C |
| temperature range | -40 ... 0 °C, +40 ... +60 °C |
| when dew point depression < 10 °C | ±3 °C |
| dew point depression = ambient temperature - dew point | |

Operating environment

| | |
|-------------------------------|--|
| Operating temperature | -40 ... +60 °C |
| Electromagnetic compatibility | Complies with EMC standard EN61326-1, Basic immunity test requirements |

Inputs and outputs

| | |
|--|---|
| Operating voltage | 5 ... 28 VDC / 8 ... 28 VDC with 5 V output |
| (Use lowest available operating voltage to minimize heating.) | 8 ... 28 VDC with loop power converter |
| Current consumption | 1 mA average, max. peak 5 mA |
| Start-up time at operating voltage | <14 V: 1 s; >14 V: 4 s |
| Outputs | |
| 2 channels | 0 ... 1 VDC / 0 ... 2.5 VDC / 0 ... 5 VDC / 1 ... 5 VDC |
| 1-channel loop-power converter (separate module, compatible with humidity accuracy only) | 4 ... 20 mA digital output (optional) |
| | RS485 2-wire half duplex |

External loads

| | |
|-------------------------|-------------------------|
| 0 ... 1 V | R_L min 10 k Ω |
| 0 ... 2.5 V / 0 ... 5 V | R_L min 50 k Ω |

Mechanics

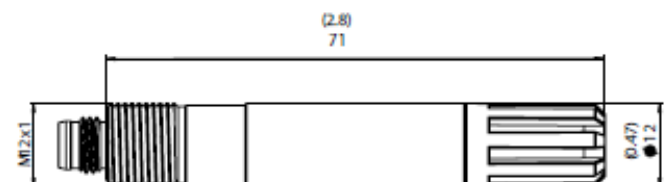
| | |
|-------------------------|---------------------------|
| Materials | |
| body | chrome coated aluminum |
| grid filter | chrome coated ABS plastic |
| cable | polyurethane or FEP |
| Housing classification | IP65 |
| Body thread | M12x1 / 10 mm |
| Cable connector | 4-pin M8 (IEC 60947-5-2) |
| Weight with 0.3 m cable | 23 g |

Options and accessories

| | |
|-------------------------------------|-------------------|
| Vaisala INTERCAP® Sensor, 1 piece | 15778HM |
| Vaisala INTERCAP® Sensor, 10 pcs | INTERCAPSET-10PCS |
| Sensor protection | |
| plastic grid | DRW010522 |
| membrane filter | DRW010525 |
| stainless steel sintered filter | HM46670SP |
| 4 ... 20mA loop power converter | UI-CONVERTER-1 |
| Mounting bracket with lid | 225979 |
| Plastic M12 installation nuts, pair | 18350SP |
| USB cable for PC connection | 219690 |
| Probe mounting clamp set, 10 pcs | 226067 |
| Probe mounting flange | 226061 |
| Connection cables | |
| 0.3 m PU | HMP50Z032 |
| 3 m PU | HMP50Z30A |
| 180°C 3 m FEP | 226902 |

Dimensions

in mm (inches)



VAISALA

For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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BAPI LOW PROFILE “BUTTON” SENSOR

[RELATED SECTION 23 09 13.23]

Model Number: BA/10K-2-LP-15

Location: Bedrooms

Dimensions:

Diameter: 3/8" [9.5 mm]

Depth: 1" [25.4 mm]

Features:

Cable type: plenum rated

Thermistors: 10 Ω @ 25°C

Low profile flush mounting sheath

Available: Building Automation Products, Inc. [BAPI]

Price: \$25.00



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Button Sensor - Low Profile Room Temperature Sensor

Part Number: **BA/LP**

Multiplier: Manufactured

Description

Buy / Configure

Documents

Media

The Low Profile "Button" Sensor is ideal for locations where aesthetics are as important as the temperature measurement. The inconspicuous room sensor mounts easily by pushing through a 3/8" hole and secured with a peel off tape strip. The only visible portion is a flush 7/8" dot on the wall.

The Button Sensor is available in multiple thermistor or RTD sensors as shown in the specifications. Other sensor types are available on request.

- Small Flush Sensor Mounting
- Accurate Direct Air Measurement
- Paintable with Latex or Oil Base
- Wide Selection of Sensing Elements
- Plenum Rated Wiring
- Limited Lifetime Warranty

Buy / Configure

Your Price: **\$25.00**

Please configure this product to see accurate pricing.



Hover for close-up.

Related Products



Certificate of Accuracy and Calibration **\$0.00**

Certificates of Accuracy and Calibration for temperature, humidity, pressure and carbon monoxide.

Building Automation Products, Inc.
750 North Royal Avenue
Gays Mills, WI 54631 USA
+1-808-735-4800



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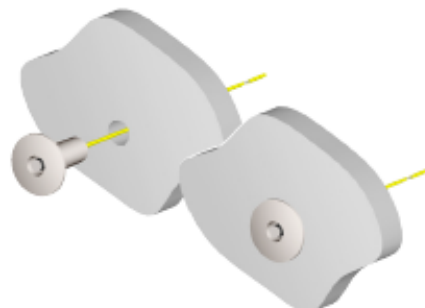
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Custom WordPress Theme and CMS by Sleeping Giant Studios

Features & Options

- Small Flush Sensor Mounting
- Accurate Direct Air Measurement
- Paintable with Latex or Oil Base
- Wide Selection of Sensing Elements
- Plenum Rated Wiring
- Limited Lifetime Warranty



Low Profile
Wall Sensor

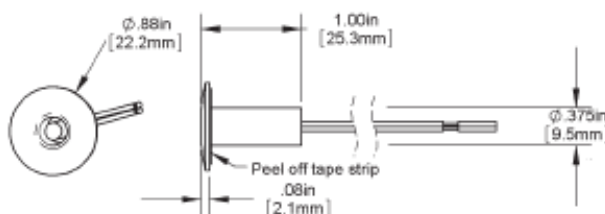


The Low Profile "Button" Sensor is ideal for locations where aesthetics are as important as the temperature measurement. The inconspicuous wall sensor mounts easily by pushing through a 3/8" hole and secured with a peel off tape strip. The only visible portion is a flush 7/8" dot on the wall. The Low Profile "Button" Sensor is available in multiple thermistor or RTD sensors as shown in the specifications. Other sensor types are available on request.

* All Passive Thermistors 10K Ω and smaller are CE compliant.

Specifications

| | |
|---|--|
| Sensor | Passive |
| Thermistor | NTC, 2 wire |
| RTD | PTC, 2 or 3 wire |
| Thermistor | Thermal resistor |
| Temp. Output | Resistance |
| Accuracy (Std) | $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$) |
| Accuracy (High) | $\pm 0.18^{\circ}\text{F}$, ($\pm 0.1^{\circ}\text{C}$), [XP] option |
| Stability | $< 0.036^{\circ}\text{F}/\text{Year}$, ($< 0.02^{\circ}\text{C}/\text{Year}$) |
| Heat dissipation | 2.7 mW/ $^{\circ}\text{C}$ |
| Temp. Drift | $< 0.02^{\circ}\text{C}$ per year |
| Probe range | -40° to 221°F (-40° to 105°C) |
| RTD | Resistance Temperature Device |
| Platinum (PT) | 100 Ω or 1K Ω @ 0°C , 385 curve, |
| Platinum (PT) | 1K Ω @ 0°C , 375 curve |
| PT Accuracy (Std) | 0.12% @Ref, or $\pm 0.55^{\circ}\text{F}$, ($\pm 0.3^{\circ}\text{C}$) |
| PT Accuracy (Hi) | 0.06% @Ref, or $\pm 0.277^{\circ}\text{F}$, ($\pm 0.15^{\circ}\text{C}$), [A] option |
| PT Stability | $\pm 0.25^{\circ}\text{F}$, ($\pm 0.14^{\circ}\text{C}$) |
| PT Self Heating | 0.4 $^{\circ}\text{C}/\text{mW}$ @ 0°C |
| PT Probe range | -40° to 221°F , (-40 to 105°C) |
| Nickel (Ni) | 1000 Ω @ 70°F , JCI curve |
| Ni Probe range | -40° to 221°F (-40 to 105°C) |
| Sensitivity | |
| Thermistor | Non-linear |
| | Go to bapihvac.com "Sensor Specs" |
| RTD (PT) | 3.85 $\Omega/^{\circ}\text{C}$ for 1K Ω RTD |
| | 3.75 $\Omega/^{\circ}\text{C}$ for 1K Ω RTD |
| | 0.385 $\Omega/^{\circ}\text{C}$ for 100 Ω RTD |
| Nickel (Ni) | 2.95 $\Omega/^{\circ}\text{F}$ for the JCI RTD |
| Lead wire: 2 or 3 conductor, 22 AWG stranded wire | |



Low Profile "Button" Sensor

Wire Insulation: Etched Teflon, Plenum rated

Wiring: Two 22 AWG wires (non-polar)

Mounting: 3/8" hole, push in plastic sheath with peel off tape strip.

Dimensions:

Plastic Sheath
Insertion..... 1.0" depth, into a 0.375" hole

Sleeve..... 0.375" Diameter

Bezel..... 0.875" Diameter

Enclosure Type: Round Flush Sensor Sheath

Enclosure ratings: NEMA 1

Encl. Material: White Delrin, UL94V-HB

Ambient (Encl.)

0 to 100% RH, Non-condensing

-40°F to 185°F , (-40° to 85°C)

Agency

RoHS, CE* (Thermistor's $< 10\text{K}\Omega$)

PT= DIN43760, IEC Pub 751-1983,

JIS C1604-1989



Rev. 11/24/10

| Ordering Information | | Low Profile "Button" Sensor - Temperature | |
|---|---------------------------|--|---|
| BA/ | | | |
| | Sensor Type | Use the designator number (shown to the left in bold) to indicate the sensor | |
| # | | <u>THERMISTORS</u> 1.8K 1.8K Ω @ 25 °C 2.2K 2.2K Ω @ 25 °C 3K 3K Ω @ 25 °C 3.3K 3.3K Ω @ 25 °C 10K-2 10K Ω @ 25 °C 10K-3 10K Ω @ 25 °C 10K-3[11K] 5,238 Ω @ 25 °C 10K-4 10K Ω @ 25 °C 10K-5 10K Ω @ 25 °C 20K 20K Ω @ 25 °C 30K 30K Ω @ 25 °C 47K 47K Ω @ 25 °C 50K 50K Ω @ 25 °C 100K 100K Ω @ 25 °C | <u>RTDs</u> 100 100 Ω Platinum @ 0 °C, .385 Ω/°C temp. coeff. 100[3W] 3 Wire 100 Ω Plat. @ 0 °C, .385 Ω/°C temp. coeff. 1K[375] 1K Ω Platinum @ 0 °C, 3.75 Ω/°C temp. coeff. 1K[Ni] 1K Ω Nickel @ 21°C, 5 Ω/°C temp. coeff. 1K 1K Ω Platinum @ 0 °C, 3.85 Ω/°C temp. coeff. 2K 2K Ω Silicon @ 20 °C, 8 Ω/°C temp. coeff. |
| | Wall Mount Fitting | | |
| | -LP | Low Profile Flush Mounting Sheath w/ 6" Teflon Leads | |
| | | Optional Lead Lengths 18" leads are standard | |
| | -5 | 5 feet of Plenum Rated Cable | |
| | -10 | 10 feet of Plenum Rated Cable | |
| | -15 | 15 feet of Plenum Rated Cable | |
| EXAMPLE | | | |
| BA/ | 10K-2 | -LP | |
| Example Part Number: BA/10K-2-LP Low Profile "Button" Sensor, 10K-2 thermistor | | | |
| Your Part Number: | | | |

Call BAPI if you have questions about the above ordering grid or the configuration of the product you are ordering.

BROAN ULTRA SILENT HUMIDITY SENSING FAN

[RELATED SECTION 23 34 00]

Model Number: QTXE110S

Location: Core Module Bath

Dimensions:

[L x W x H]: 10-1/2" x 11-3/8" x 7-5/8"

Weight: 12.2 lbs

Features:

Current: 0.3 A

0.7 Sones

110 CFM

Available: Broan-NuTone, LLC



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Ventilation - Bathroom Fans Ultra Silent Humidity Sensing Bathroom Fans



[Download Specification Sheet](#)

[Download Installation Guide](#)

NOTE: Specification Sheets and Installation Guides are provided in Adobe Acrobat Reader (.pdf) format. The most recent version of Acrobat Reader is recommended. [Click here](#) for a free download.

Humidity Sensing Fan Model QTXE110S

- 0.7 Sones
- 110 CFM
- Sensaire® technology detects the rapid rise in humidity over time
- Auto shut-off time is adjustable from 5 to 60 minutes
- Helps prevent lingering, excessive humidity which can cause mold
- Humidity is sensed at the ceiling where it is most prevalent
- Hanger bars for Easy, [Fast and Universal installation in all types of construction](#)
- UL Listed for use over bathtubs and showers when connected to a GFCI protected branch circuit.
- 6" ducting for superior performance
- ENERGY STAR® qualified

Sensaire® technology detects rapid increases in moisture levels at the ceiling, where steam and humidity naturally rise. Regular humidistats located on the wall simply detect absolute humidity levels and are prone to false triggers, or not operating when they should.

An automated solution to fight excess humidity and mold.

Our humidity sensing fans turn on and off automatically to help prevent cosmetic and structural problems associated with excess moisture.

Adjust the sensitivity level and run-time.

Just beneath the drop-down grille are easy-to-adjust sensitivity and run-time controls. Choose your preference, set with a screwdriver and forget it. Of course, you can always override the sensor at the touch of a switch.

Hands-free operation.

Since you never have to worry about turning the fan on, Broan Ultra Silent™ is ideal for problem areas in residential, institutional and light-commercial applications. Our exclusive Sensaire® technology is a perfect solution for high-traffic bathrooms, or a kid's bathroom.

It turns off automatically, and that saves money.

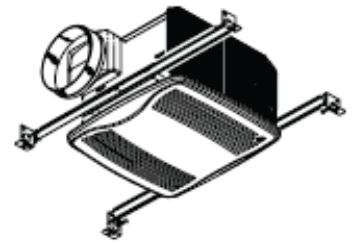
Humidity sensing fans are ideal for anyone who leaves the house before humidity is properly vented. With a fan this quiet, you can't forget to turn it off when the job is done. That saves energy and money.

Contact your [local dealer](#) for pricing information.

Additional Models Available:

| | |
|--------------------------|----------------------|
| QTRE100S | Humidity Sensing Fan |
| QTXE110S | Humidity Sensing Fan |

MODEL QTXE110S VENTILATOR



A modern-styled, high performance fan, with sensing circuitry, that “knows” when to ventilate the room.

FEATURES

BLOWER:

- Plug-in, permanently lubricated motor - engineered for continuous operation
- Dynamically balanced centrifugal blower wheel for quiet, efficient performance
- Maintains a high percentage of rated CFM in less than ideal installations
- Low RPM for quiet operation

HOUSING:

- Rugged, 26 gauge, galvanized steel construction
- 6" round ducting for superior performance
- Polymeric duct connector with tapered sleeve and no metallic clatter
- 7-5/8" height allows for 2" x 8" (nominal) joist installations
- Sturdy, easy, four-point mounting directly to joist
- Includes unique spacer (patent pending) for mounting to engineered "I" joists
- Includes hanger bars to position housing anywhere between 16" to 24"-on-center joists
- Two sets of mounting holes for hanger bars allow flush installation with bottom or top of drywall

GRILLE:

- Integrated humidity sensor
- Polymeric construction
- Innovative design - the result of extensive research with designers and consumers

AUTOMATIC CONTROL:

- Humidity control automatically turns fan ON when either of these conditions is detected:
 - a rapid to moderate (user adjustable) increase of humidity
 - humidity above user-adjustable set-point (50%-100% RH)
- Two wire manual operation for odor control - Turns fan ON when power line through wall switch is cycled ON, OFF and back ON
- Remains ON for a user-adjustable 5 to 60 minutes after humidity has stabilized and is below set-point or after manually initiated through power line cycling
- Saves energy because unit runs only for the time required. A unit controlled with a wall timer may keep fan ON longer than required or turn it OFF before room is sufficiently ventilated

ACCESSORY CONTROL (Purchase separately):

Designed by Broan for use with this product (purchase separately)

- Model 68V, P68V (Ivory) / 68W (White) 2-Function Wall Control

U.L. Listed for use over bathtubs and showers when connected to a GFCI protected branch circuit (ceiling mount only).

3-Year Warranty



Broan-NuTone LLC Hartford, Wisconsin www.broan.com 800-558-1711

| REFERENCE | QTY. | REMARKS | Project |
|-----------|------|---------|--|
| | | | Location |
| | | | Architect |
| | | | Engineer |
| | | | Contractor |
| | | | Submitted by Date |

TYPICAL SPECIFICATION

Ceiling Ventilator shall be Broan Model QTXE110S.

The unit will have a control that will automatically turn fan ON when humidity increase is rapid to moderate (user adjustable), or when humidity is higher than user-adjustable set-point (50%-100% Relative Humidity), or when supply power is cycled from ON (for more than a second) to OFF (for less than a second) and back ON. It shall be user-adjustable to turn OFF 5 to 60 minutes after humidity has stabilized and is below user-adjustable set-point, or after manually initiated by supply power cycling.

Ceiling Ventilator shall have corrosion resistant galvanized steel housing with four-point mounting capability. It shall be ducted to a roof or wall cap using 6" round ductwork.

Blower assembly shall be removable, have a centrifugal-type blower wheel and a permanently lubricated motor designed for continuous operation.

Non-metallic damper/duct connector shall be included.

Air delivery shall be no less than 110 CFM and sound level no greater than 0.7 Sones. All air and sound ratings shall be certified by HVI.

Ceiling Ventilator shall be Energy Star® qualified and have an energy efficient permanent split capacitor motor.

Ceiling Ventilator shall be U.L. Listed for use over bathtubs and showers when connected to a GFCI protected branch circuit.

PERFORMANCE RATINGS MODEL QTXE110S VENTILATOR

HVI PERFORMANCE

| Model | Sones @0.1" Ps | CFM @0.1" Ps |
|----------|-------------------|-----------------|
| QTXE110S | 0.7 | 110 |



HVI-2100 CERTIFIED RATINGS comply with new testing technologies and procedures prescribed by the Home Ventilating Institute, for off-the-shelf products, as they are available to consumers. Product performance is rated at 0.1 in. static pressure, based on tests conducted in a state-of-the-art test laboratory. Sones are a measure of humanly-perceived loudness, based on laboratory measurements.

AMPS

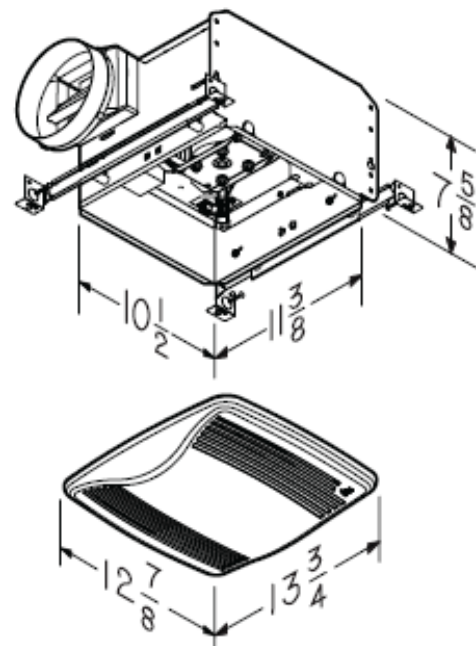
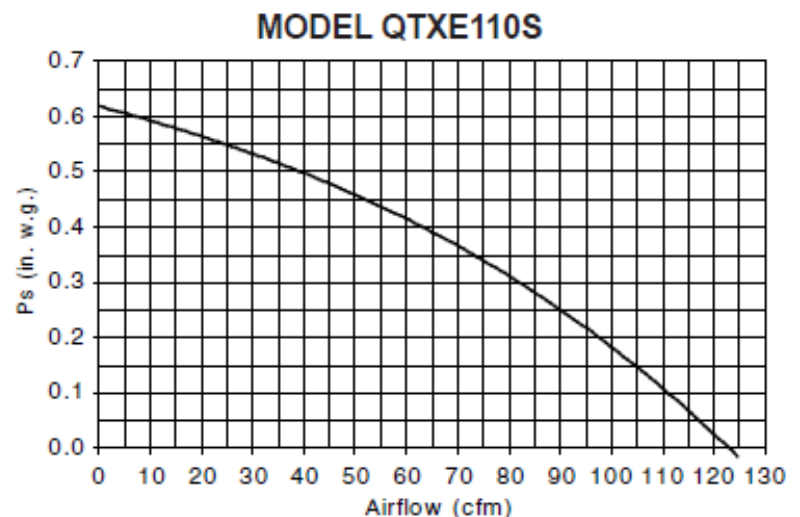
| Model | Amps* |
|----------|-------|
| QTXE110S | 0.3 |

* Total connected load

WEIGHT

| Model | Shipping Weight |
|----------|-----------------|
| QTXE110S | 12.2 lbs. |

AIR FLOW PERFORMANCE



BROAN

Broan-NuTone LLC Hartford, Wisconsin www.broan.com 800-558-1711

PANASONIC PASSIVE INLET VENT

[RELATED SECTION 23 37 00]

Model Number: FV-GKF32S1

Location: Bedrooms

Dimensions:

Diameter: 3" [76.2 mm]

Length: 12" [304.8 mm]

Features:

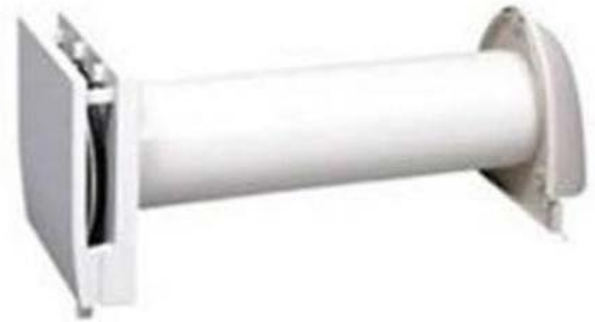
2 position air delivery

Insulating lining

3 setting positions: closed, 12 cfm, 18 cfm

Available: Amazon

Price: \$61.60



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Panasonic FV-GKF32S1 Passive Inlet Vent

by [Panasonic](#)[Be the first to review this item](#) | [Like](#) (0)List Price: ~~\$93.00~~Price: [See price in cart](#) (Why don't we show the price?)This item ships for **FREE with Super Saver Shipping.** [Details](#)**In Stock.**Ships from and sold by **Amazon.com**. Gift-wrap available.

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- [Passive Ventilation](#) - Go Green With **Panasonic's** Energy Star Rated Ventilation Systems. www.panasonic.com/VentilationFans

Product Specifications

| | |
|------------------------|------------|
| Part Number: | FV-GKF32S1 |
| Color: | White |
| Item Package Quantity: | 1 |
| Item Dimensions | |
| Length: | 3 inches |
| Width: | 3 inches |
| Height: | 12 inches |

Technical Details

- Provides makeup (outside) air to help balance indoor versus outdoor air pressure
- Through-the-wall sleeve has 3-Inch diameter and 12-Inch length and fits a 3-Inch wall opening
- Foam pad reduces outdoor noise and condensation
- Insulation lining also prevents condensation
- Durable ABS and PP resin body and includes seven stainless steel installation screws

Product Description

From the Manufacturer

Home ventilation is one of the most important things you can manage in order to maintain a healthy environment for you and your loved ones. The air in your home is used many times over, often with fresh air entering only when we open doors or windows. Very tight homes benefit from the use of controlled air vents that allow for fresh, draft-free make-up air to enter the house. Put these passive air inlets high on an exterior wall in every bedroom and one in a central living space to insure a constant supply of controlled fresh make-up air. The Panasonic FV-GKF32S1 Passive Inlet Vent provides makeup (outside) air to help balance indoor versus outdoor air pressure. The foam pad reduces outdoor noise and condensation and the insulation lining also prevents condensation. It has a durable ABS and PP resin body and includes seven stainless steel installation screws. The through-the-wall sleeve is three inches in diameter and 12 inches long and fits a 3-Inch wall opening. It has a washable air filter and a secure bug screen. With three positions, it can be completely closed with a flip of a lever or set as 12 or 18 CFM (cubic feet per minute). The Panasonic FV-GKF32S1 Passive Inlet Vent is covered by a manufacturer warranty for period of three years from the date of the original purchase and is sold one item per package.

Product Description

The Panasonic FV-GKF32S1 Passive Inlet
Panasonic Passive Inlet Model: FV-GKF32S1
Model: FV-GKF32S1
Wall Mounted
3 Setting Positions: Closed
12 & 18 CFM
Panasonic Passive Inlet provides make-up air to help balance indoor/outdoor air pressure. Advantages:- Sturdy open/close lever- 2 position air delivery- Washable air filter- Bug Screen- Foam backing reduces outdoor noise and condensation- 3" diameter, 12" length through-the-wall sleeve- Durable ABS and PP resin body- Stainless steel installation screws included

Quantity: 1



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Specification Data

Panasonic Ventilation Fan

Panasonic

Description

Panasonic Passive Inlet provides make up air to help balance indoor vs. outdoor air pressure.

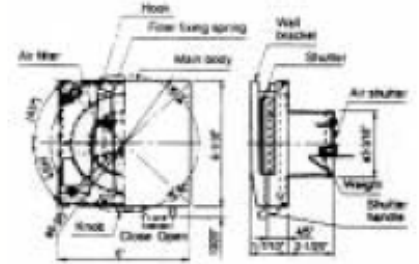
Body:

- Durable ABS and PP resin body.
- Sturdy open/close lever.
- 2 Position air delivery (12 & 18 cfm).
- Washable air filter.
- Foam covering reduces outdoor noise and condensation.
- 12 inch through wall sleeve can be cut to required length.
- Exterior hood with bug screen included.

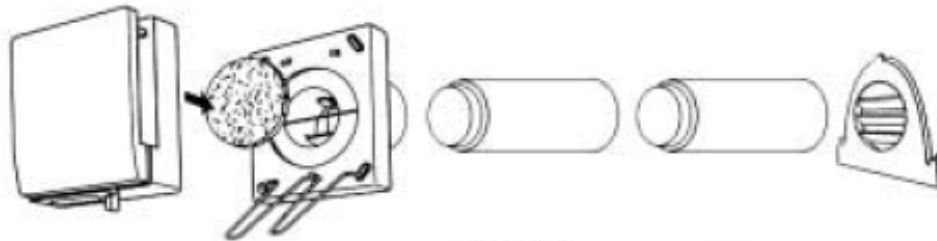
Typical Specifications:

Passive Inlet vent shall be through-the-wall type with open/close lever. Inlet shall provide 12 or 18 cfm. Inlet shall include through wall sleeve and exterior hood. Inlet shall include air filter, bug screen and sound abatement padding.

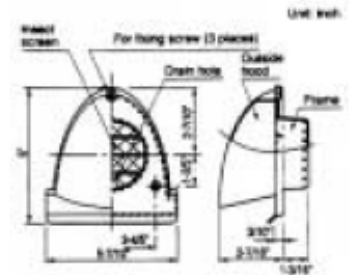
FV-GKF32S1



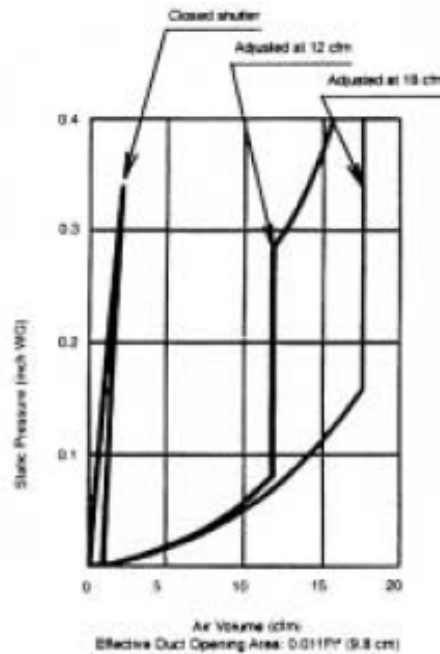
Interior Inlet



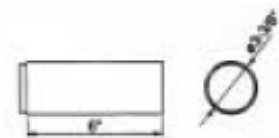
Exploded View



Exterior Hood



Exterior hood



Wall Sleeve

For Complete Installation Instructions Visit www.panasonic.com/building



| Model | Quantity | Comments | Project: |
|-------|----------|----------|---------------|
| | | | Location: |
| | | | Architect: |
| | | | Engineer: |
| | | | Contractor: |
| | | | Submitted by: |
| | | | Date: |

PHASE CHANGE MATERIAL

[RELATED SECTION 23 71 00]

Model Number: BIOPCM-27M

Location: Living Module

Features:

Oil based phase change material with a peak melting point at approximately 27°C

Used as per the design and engineering of the Adjustable Trombe wall system in the living room

Stored within extruded aluminum tubing and then sealed within the tube with welds that is then mounted on a racking device and placed in front of glazing inside the conditioned space.

Device will be supplemental to the [HVAC] system within the space and will perform passive cooling and heating as it goes through thermo-cycles.

Available: Phase Change Energy Solutions



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bioPCMmat 27°C / 79°F

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- 16x12" .30"
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- .56" 2" Pocket
Sample
- 16x48" .56"
- 16x96" .56"
- 16x48" 1.0"
- EF16x48" .56"
- Panel O37C 8x12"
7oz"



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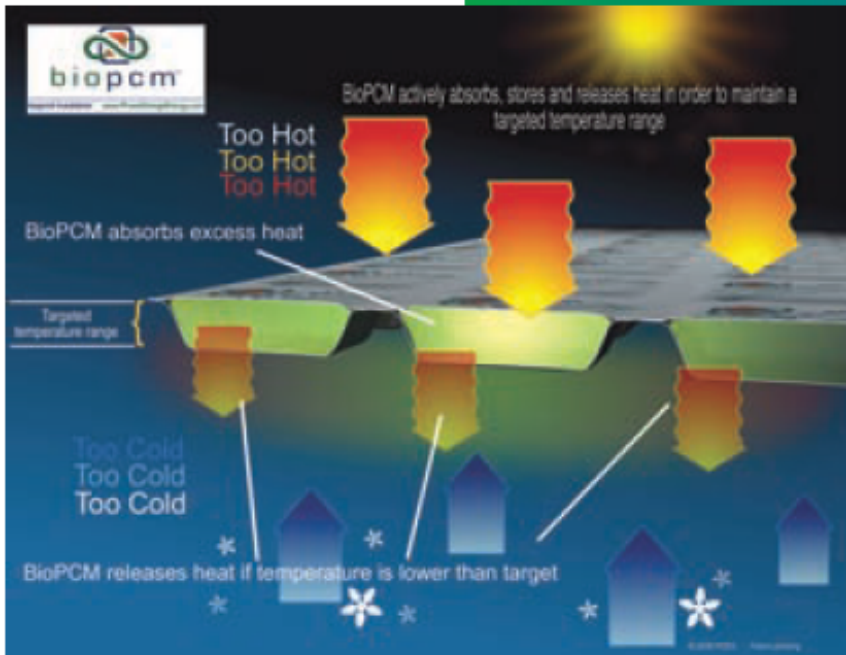
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336-301-0557

This brochure offers an overview of BioPCM™ applications. Please contact us to discuss your specific project. We offer a variety of customizable solutions designed for your specific needs.

BioPCM™ phase change material

| BioPCM™ Mats | Unit | 23°C / 73°F | | | 25°C / 76°F | | | 27°C / 79°F | | |
|---|-------|---------------|----------------|--------------|---------------|----------------|--------------|---------------|----------------|--------------|
| | | .3 lb/sq. ft. | .56 lb/sq. ft. | 1 lb/sq. ft. | .3 lb/sq. ft. | .56 lb/sq. ft. | 1 lb/sq. ft. | .3 lb/sq. ft. | .56 lb/sq. ft. | 1 lb/sq. ft. |
| Thickness | mil | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| Weight per square foot | lb | 0.53 | 0.77 | 1.32 | 0.53 | 0.76 | 1.31 | 0.53 | 0.76 | 1.31 |
| Total unit thickness | in | .25-.35 | .4-.6 | 1 | .25-.35 | .4-.6 | 1 | .25-.35 | .4-.6 | 1 |
| Dimensions (material width) | mm/in | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 | 419.1/16.5 |
| Energy Store values- Other temps available | | | | | | | | | | |
| PCM loading | % | 73% | 76% | 75% | 73% | 76% | 75% | 73% | 76% | 75% |
| Melt point* | °C/°F | 23/73 | 23/73 | 23/73 | 25/76 | 25/76 | 25/76 | 27/79 | 27/79 | 27/79 |
| Latent heat storage capacity | J/g > | 165-200** | 165-200** | 165-200** | 165-200** | 165-200** | 165-200** | 165-200** | 165-200** | 165-200** |

* The temperatures shown in the products table are within close proximities of the "true" melting temperatures. Like all PCM, there is a small range that the PCM melts in. Please call or email if you have any questions, if your specifications require a different temperature, you need to know if the melting range covers your specifications or if you would like to discuss your potential application.

** Depending on formulation and application of product.

NOTE: All Phase Change Energy building products are tested to ASTM E84 standards

NOTE: Custom formulations for temperature and loading also available

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Phase Change Energy Solutions

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FAX: 336-629-3100

email: info@phasechangeenergy.com
www.phasechangeenergy.com

MITSUBISHI MR. SLIM MINI SPLIT HEAT PUMP [OUTDOOR UNIT]

[RELATED SECTION 23 81 43]

Model Number: MXZ-2B20NA

Location: HVAC Compartment

Dimensions:

Width: 33-1/6" [840 mm]

Height: 27-15/16" [710 mm]

Depth: 13" [330 mm]

Features:

Weight: 130 lbs [59 kg]

SEER [efficiency]: 18

Rated cooling capacity: 18,000 BTU/hr - 20,000 BTU/hr

Rated heating at 47°F capacity: 22,000 BTU/hr

Rated heating at 17°F capacity: 12,500 BTU/hr

Available: Gemaire Distributors Inc



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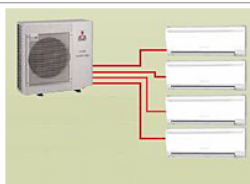
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Request Information

Outdoor Unit Item # MXZ-2B20NA-1, Wall-Mounted Multi-Room Inverter Heat Pumps



[larger image](#)

Multi-Room Wall-mounted INVERTER Heat Pumps

Available in 2-to-1, 3-to-1, 4-to-1 and 8-to-1 indoor units to one outdoor unit systems with wall-mounted and/or ducted indoor unit styles in a wide range of capacities, the MXZ multiroom system has the right solution for your needs.

Test conditions are based on AHRI 210/240. One indoor unit is turned off during low-speed testing under the new test conditions. Systems actually exhibit higher energy efficiencies during normal operation.

Power factor equals 97 percent.
Specifications are subject to change without notice.
Limited warranty: Seven-year warranty on compressor. Five-year warranty on parts.

[Outdoor Unit](#) - [Specifications](#) - [Additional Information](#)

Outdoor Unit

| | |
|--|--------------------------------|
| Cooling Rated Capacity ? | 18000 Btu/hr |
| Heating at 47° F Rated Capacity ? | 22000 Btu/hr |
| Heating at 17° F Capacity ? | 12500 Btu/hr |
| Minimum Circuit Amps | 15 A |
| Maximum Overcurrent Protection | 20 A |
| Compressor - Type | DC INVERTER-driven Twin Rotary |
| Sound Pressure Level (Cooling/Heating) ? | 49 / 51 dBA |
| Height | 33-1/16 in |
| Width | 27/15/16 in |
| Depth | 13 in |
| Weight | 130 lb |

Specifications

| | |
|--|---|
| Power Supply for 60Hz ? | 1-phase, 208/230 V |
| Voltage Indoor - Outdoor S1-S2 | AC 208/230 V |
| Voltage Indoor - Outdoor S2-S3 | DC12-24 V |
| Refrigerant - Oil Type | Associated With Indoor Unit Model fl oz |
| Refrigerant Pipe Gas Side (Outside Diameter) | R410A in |
| Refrigerant Pipe Length (Max.) | 164 ft |
| Connection Method Indoor/Outdoor | Flared/Flared |

Additional Information

Multi-zone systems mean that people can enjoy their ideal level of comfort no matter where they are in the home. Each zone (room) operates independently. People in the kitchen, master bedroom or living room can all enjoy the temperatures that makes them feel most comfortable. If you're looking for a complete comfort solution for several different rooms, the MXZ multi-zone system is the right choice for you. You can use up to 19 different indoor unit combinations so the system is flexible enough to conform to your particular cooling and heating needs with up to four rooms from one outdoor unit. And now with a SEZ ceiling-concealed ducted unit you can enjoy a greater range of zoning options with a MXZ system.

Request Information

MORE IMAGES

- [Rating Conditions](#)
- [Refrigerant Line Length](#)
- [Rated Combinations](#)
- [SEER and HSPF Ratings](#)

DOWNLOADS

- [Multiple Rooms with Individual Control from a Single System](#) (PDF, 2043KB)
- [M Series Features and Benefits](#) (PDF, 2399KB)
- [MXZ System Combination Options](#) (PDF, 1942KB)

Accessories

[Accessories for MXZ Series](#)

Indoor Units



[MSZ Wall-mounted models Indoor Units Heat Pumps](#)

SUBMITTAL DATA: MXZ-2B20NA
MULTI-INDOOR INVERTER HEAT-PUMP SYSTEM

| | | |
|-------------------|--|-------|
| Job Name: | Location: | Date: |
| Purchaser: | Engineer: | |
| Submitted to: | For <input type="checkbox"/> Reference <input type="checkbox"/> Approval <input type="checkbox"/> Construction | |
| Unit Designation: | Schedule No.: | |

GENERAL FEATURES

- Compact side discharge outdoor unit
- Wireless or wired remote controller, depending on the indoor units used
- Quiet operation—both indoor and outdoor units
- Automatic fan speed control
- Auto restart following a power outage
- Self-check function—integrated diagnostics
- Advanced microprocessor control
- Limited warranty: five years on parts and defects and seven years on compressors



Outdoor Unit: MXZ-2B20NA

OPTIONAL OUTDOOR UNIT ACCESSORIES

- Air Outlet Guide (MAC-889SG)
- 3/8" x 1/2" Port Adapter (MAC-A454JP-E; for use with 15,000 Btu/h Indoor units)

Cooling*

Rated Capacity (Non-ducted/Ducted) . . . 18,000 Btu/h / 20,000 Btu/h
 Minimum Capacity (Non-ducted/Ducted) . . . 7,800 Btu/h / 7,800 Btu/h
 Total Input (Non-ducted/Ducted) 1,440 W / 2,190 W

Heating at 47°F*

Rated Capacity (Non-ducted/Ducted) . . . 22,000 Btu/h / 22,000 Btu/h
 Minimum Capacity (Non-ducted/Ducted) . . . 8,500 Btu/h / 8,500 Btu/h
 Total Input (Non-ducted/Ducted) 1,850 W / 1,780 W

Heating at 17°F*

Rated Capacity (Non-ducted/Ducted) . . . 12,500 Btu/h / 12,500 Btu/h
 Total Input (Non-ducted/Ducted) 1,350 W / 1,430 W

* Rating Conditions (Cooling) - Indoor: 80°F (27°C) DB / 67°F (19°C) WB, Outdoor: 95°F (35°C) DB / 75°F (24°C) WB.
 (Heating) - Indoor: 70°F (21°C) DB / 60°F (16°C) WB, Outdoor: 47°F (8°C) DB / 43°F (6°C) WB.
 (Heating at 17°F) - Indoor: 70°F (21°C) DB / 60°F (16°C) WB, Outdoor: 17°F (-9°C) DB / 15°F (-9°C) WB.

(For data on specific Indoor units [all ducted, all non-ducted, and both ducted and non-ducted] combinations, see the MXZ Technical and Service Manual.)

Electrical Requirements

Power Supply 208 / 230V, 1-Phase, 60 Hz
 Breaker Size 20 A
 MCA 15 A

Voltage

Indoor - Outdoor S1-S2 AC 208 / 230V
 Indoor - Outdoor S2-S3 DC 12 - 24V

OPERATING RANGE

| | | Indoor Intake Air Temp. | Outdoor Intake Air Temp. |
|---------|---------|--------------------------------|----------------------------------|
| Cooling | Maximum | 95°F (35°C) DB, 71°F (22°C) WB | 115°F (46°C) DB |
| | Minimum | 67°F (19°C) DB, 57°F (14°C) WB | 14°F (-10°C) DB |
| Heating | Maximum | 80°F (27°C) DB, 67°F (19°C) WB | 75°F (24°C) DB, 65°F (18°C) WB |
| | Minimum | 70°F (21°C) DB, 60°F (16°C) WB | 14°F (-10°C) DB, 12°F (-11°C) WB |

Compressor DC Inverter-driven Twin Rotary
 Fan Motor 0.96 F.L.A.

Sound Pressure Level

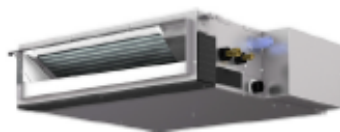
Cooling (Non-ducted/Ducted) 49 dB(A)
 Heating (Non-ducted/Ducted) 51 dB(A)

| DIMENSIONS | INCHES / MM |
|------------|----------------|
| W | 33-1/16 / 840 |
| D | 13 / 330 |
| H | 27-15/16 / 710 |

Weight 130 lbs. / 59 kg
 External Finish Munsell No. 5Y 8.0 / 1.0
 Refrigerant Type R410A
 Refrigerant Pipe Size O.D. — Two Ports
 Gas Side A, B: 3/8" / 9.52 mm
 Liquid Side 1/4" / 6.35 mm
 Max. Refrigerant Pipe Length 164' / 50 m
 Max. Refrigerant Pipe Height Difference
 If Indoor Unit is Above Outdoor Unit 49' / 15 m
 If Indoor Unit is Below Outdoor Unit 33' / 10 m
 Connection Method Flared

COMPATIBLE INDOOR UNITS AND ASSOCIATED REMOTE CONTROLLERS

Horizontal-ducted Indoor Units: SEZ-KD09, 12, 15, 18NA


 Remote Controller PAR-21MAA -
 Packaged with SEZ

Wall-mounted Indoor Units: MSZ-A09, 12, 15, 17NA and MSZ-GE09, 12, 15, 18NA



Wall-mounted Indoor Units: MSZ-FD09, 12NA
 and MSZ-FE09, 12NA


 Wireless Remote Controller -
 Packaged with MSZ-A, -GE, -FD,
 and -FE (Optional Wired PAR-21-
 MAA Remote Controller)

Refer to the separate submittal forms for the SEZ and MSZ Indoor Units.

MXZ-2B20NA ENERGY EFFICIENCIES

| Indoor Unit Type | SEER | HSPF |
|-----------------------|------|------|
| Non-ducted | 18 | 8.9 |
| Ducted and Non-ducted | 16.7 | 8.7 |
| Ducted | 15.5 | 8.5 |

MXZ-2B20 Combinations* (with wall-mounted and/or horizontal-ducted indoor units)

| Indoor Unit (Unit A + Unit B) Combinations | Cooling Capacity (Btu/h) | | | Power Usage (W) |
|--|--------------------------------|--------------------------------|---|--------------------------------|
| | Heating Capacity (Btu/h) | | | |
| | Unit A | Unit B | Total | |
| 9 + 9 | 9,000 | 9,000 | 18,000 | 1,440 - 1,780 |
| | Wall: 11,000 Ducted: 10,900 | Wall: 11,000 Ducted: 10,900 | All Wall-mounted MSZ: 22,000 All Ducted SEZ: 21,800 Combination: 21,900 | 1,650 - 1,820 |
| 9 + 12 | 8,500 | 11,500 | 20,000 | 1,660 - 2,190 1,650 - 1,780 |
| | 9,500 | 12,500 | | |
| 9 + 15 | 7,500 | 12,500 | 22,000 | 1,630 - 2,190 1,650 - 1,780 |
| | 8,250 | 13,750 | | |
| 12 + 12 | 10,000 | 10,000 | 11,000 | 1,630 - 2,190 1,650 - 1,780 |
| | 11,000 | 11,000 | | |

* Information provided at 208/230V.

SYSTEM COMPONENTS

Outdoor Unit MXZ-2B20NA

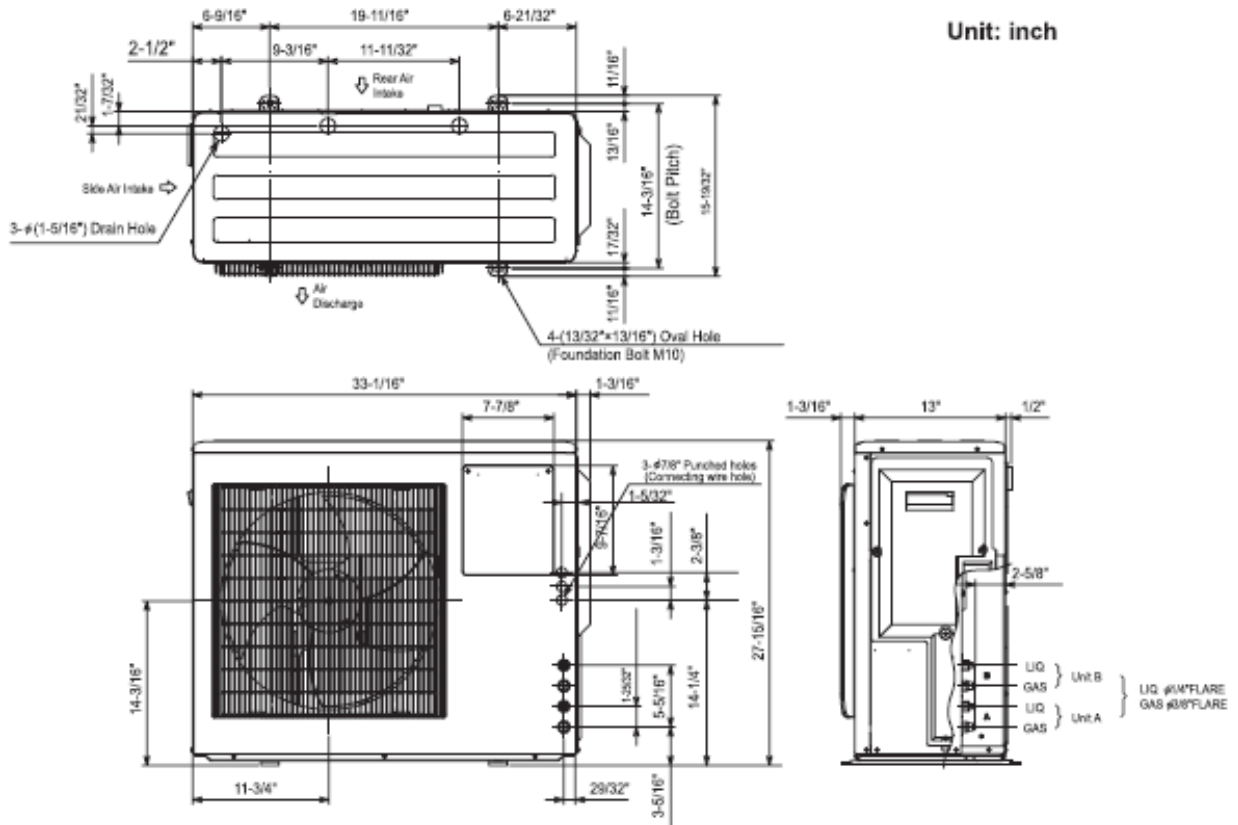
Indoor Unit Two Indoor Units

Necessary (Select Style as Installation Requires)



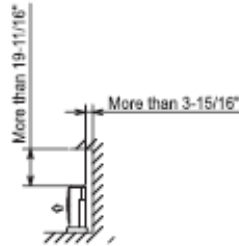
DIMENSIONS: MXZ-2B20NA

Unit: inch

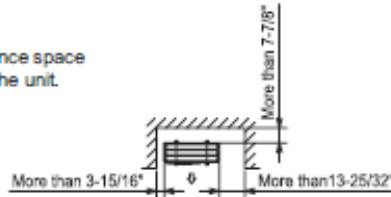


1. Installation space

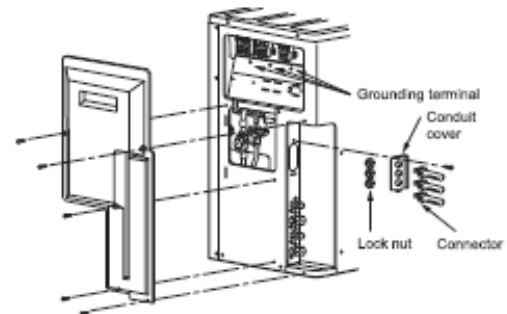
Note: Include enough clearance space in the front and both sides of the unit.



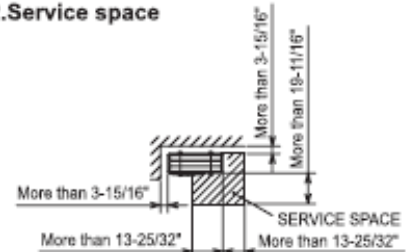
Note: Include enough clearance space in the front and top of the unit.



Note: Include enough clearance space in the back, top, and both sides of the unit.



2. Service space



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 www.mehvac.com
 Specifications are subject to change without notice.

MITSUBISHI MR. SLIM MINI SPLIT HEAT PUMP [INDOOR UNIT]

[RELATED SECTION 23 81 43]

Model Number: MXZ-2B20NA

Location: Laundry Closet, Mechanical Closet

Dimensions:

Width: 31-1/8" [790 mm]

Height: 7-7/8" [200 mm]

Depth: 27-9/16" [700 mm]

Features:

Weight: 40 lbs [18 kg]

SEER [efficiency]: 15

Rated cooling capacity: 9,000 BTU/hr

Rated heating capacity: 10,900 BTU/hr

Available: Gemaire Distributors Inc



Search Catalog

 All Categories SEZ Horizontal-ducted models Indoor Units Heat Pumps

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Request Information
Indoor Unit Item # SEZ-KD09NA, Ceiling-concealed Inverter Heat Pumps
SEZ Horizontal Ducted Indoor Units for MXZ Heat Pump Systems

SEZ ducted units can provide similar split air-conditioning system advantages, with the added benefit of being concealed to provide virtually no visual footprint within the conditioned space other than a register and grille for the air to flow. With the use of short run ductwork, these units can provide comfort to a single room that needs air dispersed evenly throughout the space, unusually shaped rooms and even adjacent rooms.

Other features of the SEZ unit on MXZ systems include:

- Concealed design for short run ductwork
- Quiet operation
- Built-in condensate lift mechanism
- Wired remote control

Specifications are subject to change without notice.

Limited warranty: Seven-year warranty on compressor. Five-year warranty on parts.

For Use with all MXZ-Series

DOWNLOADS

-  [M Series Features and Benefits](#) (PDF, 2399KB)
-  [Multiple Rooms with Individual Control from a Single System](#) (PDF, 2043KB)

Specifications

| | |
|---|----------------------------------|
| Cooling Rated Capacity ? | 9000 Btu/hr |
| Cooling Total Input ? | 60 W |
| Heating at 47° F Capacity Range ? | 10900 Btu/hr |
| Heating at 47° F Total Input ? | 40 W |
| Power Source ? | 1-phase, 208/230 V |
| Voltage Indoor - Outdoor S1-S2 | AC 208/230 V |
| Voltage Indoor - Outdoor S2-S3 | DC24 V |
| Minimum Circuit Amps ? | 1.0 A |
| Fan - Motor Output | 96 W |
| Fan - Airflow (Lo-Med-Hi) | 194-247-317 ft ³ /min |
| Fan - External Static Pressure ? | 0.02-0.06-0.14-0.20 in.W.G. |
| Sound Pressure Levels (Lo-Med-Hi) | 23-26-30 dBA |
| External Finish | Galvanized-steel Sheet |
| Height | 7-7/8 in |
| Width | 31-1/8 in |
| Depth | 27-9/16 in |
| Weight | 40 lb |
| Drain Lift Mechanism - Height (Included) | 21-11/16 in |
| Field Drainpipe Size - Outside Diameter | 1-1/4 in |
| Remote Controller - Type | Wired Controller (PAR-21MAA) |
| Refrigerant - Type | R410 A |
| Refrigerant Pipe Gas Side (Outside Diameter) | 3/8 in |
| Refrigerant Pipe Liquid Side (Outside Diameter) | 1/4 in |
| Connection Method | Flared/Flare |

SUBMITTAL DATA: SEZ-KD09NA

9,000 BTU/H HORIZONTAL-DUCTED INDOOR UNIT FOR MXZ MULTI-ZONE HEAT-PUMP SYSTEMS

| | | |
|---------------------|--|-------|
| Job Name: | Location: | Date: |
| Purchaser: | Engineer: | |
| Submitted to: | For <input type="checkbox"/> Reference <input type="checkbox"/> Approval <input type="checkbox"/> Construction | |
| System Designation: | Schedule No.: | |

GENERAL FEATURES

- Ceiling-concealed ducted indoor unit for residential applications
- Ultra thin body: 7-7/8" high
- Built-in drain mechanism for condensate removal; lifts to 21-11/16"
- Air filter is included with indoor unit
- Quiet operation — as low as 23 dBA
- PAR-21MAA wired remote controller is included
- Indoor unit powered from outdoor unit using A-Control
- Automatic fan speed control
- Auto restart following a power outage
- Limited warranty: one year on parts and defects

OPTIONAL ACCESSORIES

- M-NET Control Adapter (MAC-399IF)
- External Heat Adapter (PAC-YU25HT)
- CN24 Relay Kit (CN24RELAY-KIT-CM)
- Three-pole Disconnect Switch (TAZ-MS303)

Cooling*

Rated Capacity 9,000 Btu/h
 Total Input 80 W
 Current 0.51 A

Heating*

Rated Capacity 10,900 Btu/h
 Total Input 40 W
 Current 0.39 A

* Rating Conditions (Cooling) - Indoor: 80°F (27°C) DB / 67°F (19°C) WB.
 Outdoor: 95°F (35°C) DB / 75°F (24°C) WB.

(Heating) - Indoor: 70°F (21°C) DB / 60°F (16°C) WB. Outdoor: 47°F (8°C) DB / 43°F (6°C) WB.

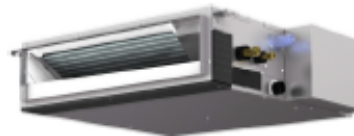
(For data on specific Indoor units [all ducted, all non-ducted, and both ducted and non-ducted] combinations, see the MXZ Technical and Service Manual.)

Electrical Requirements

Power Supply 208 / 230V, 1-Phase, 60 Hz
 MCA 1 A

Voltage

Indoor - Outdoor S1-S2 AC 208 / 230V
 Indoor - Outdoor S2-S3 DC 24V



Indoor Unit: SEZ-KD09NA



Remote Controller: PAR-21MAA

Fan

Type x Quantity Sirocco Fan x 2
 Motor Direct-driven DC Brushless Motor
 Motor Output 96 W
 Airflow (Lo - Med - Hi) 194 - 247 - 317 CFM
 Air Filter Polypropylene Honeycomb
 External Static Pressure 0.02 - 0.06 - 0.14 - 0.20"WG
 Sound Pressure Level (Lo - Med - Hi) 23 - 26 - 30 dB(A)

| DIMENSIONS | UNIT INCHES / MM |
|------------|------------------|
| W | 31-1/8 / 790 |
| D | 27-9/16 / 700 |
| H | 7-7/8 / 200 |

Weight 40 lbs. / 18 kg

Field Drainpipe Size O.D. 1-1/4" / 32 mm
 Wall-mounted Remote Controller PAR-21MAA
 (See Data Submittal Sheet)

Refrigerant Type R410A
 Refrigerant Pipe Size O.D.
 Gas Side 3/8" / 9.52 mm
 Liquid Side 1/4" / 6.35 mm
 Connection Method Flared

MXZ MULTI-ZONE HEAT-PUMP OUTDOOR UNITS


Outdoor Unit: MXZ-SA30NA

MXZ MULTI-ZONE SYSTEMS CAN INCLUDE:

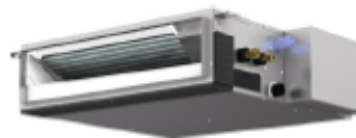
- All Horizontal-ducted Indoor Units: **SEZ-KD09, 12, 15, 18NA**
 - Select Wall-mounted Indoor Units: **MSZ-A09, 12, 15, 17, 24NA** and **MSZ-FD09, 12NA**
 - A combination of both Horizontal-ducted and Wall-mounted Indoor Units
- Refer to the separate submittal forms for the MSZ-A and MSZ-FD Indoor Units and MXZ Outdoor Units.

MXZ COMPATIBLE INDOOR UNITS AND REMOTE CONTROLLERS


Wall-mounted Indoor Unit: MSZ-A09, 12, 15, 17, 24NA



Wall-mounted Indoor Unit: MSZ-FD-NA


 Wireless Remote Controller -
 Packaged with MSZ-A and MSZ-FD
 (Optional Wired Remote Controller
 PAR-21MAA)


Horizontal-ducted Indoor Unit: SEZ-KD-NA

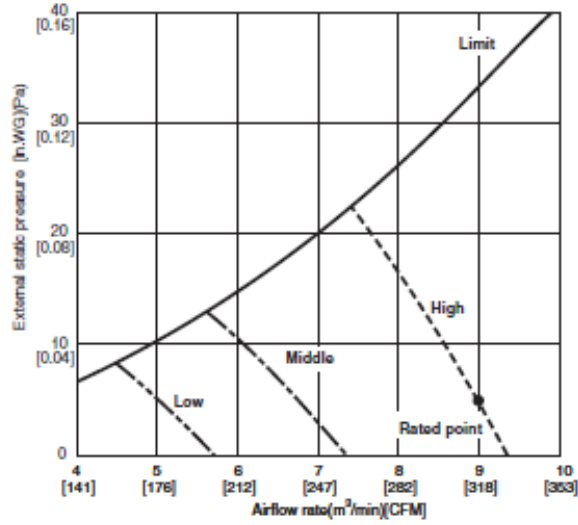

 Remote Controller
 PAR-21MAA -
 Packaged with SEZ

INVERTER

SEZ-KD09NA INDOOR FAN PERFORMANCE AND CORRECTED AIR FLOW CHARTS

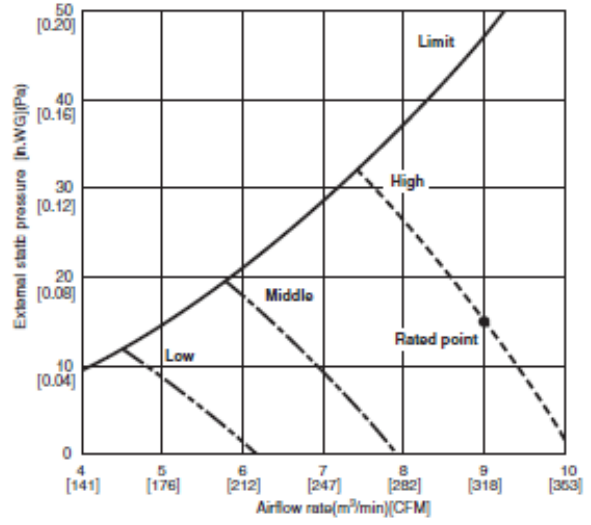
SEZ-KD09NA

(External static pressure 0.02[in.WG](5Pa)) 208/230V 60Hz



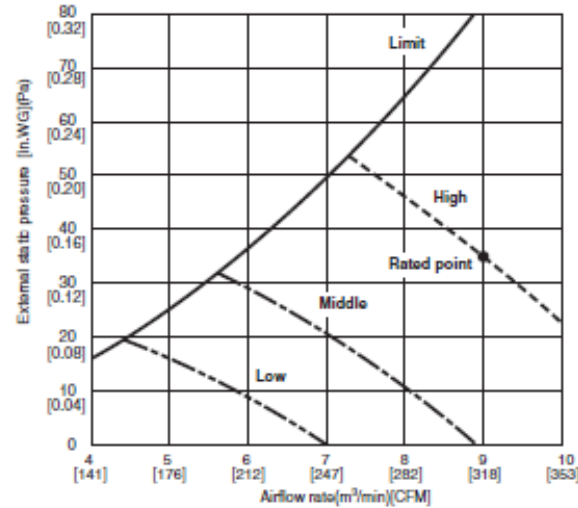
SEZ-KD09NA

(External static pressure 0.06[in.WG](15Pa)) 208/230V 60Hz



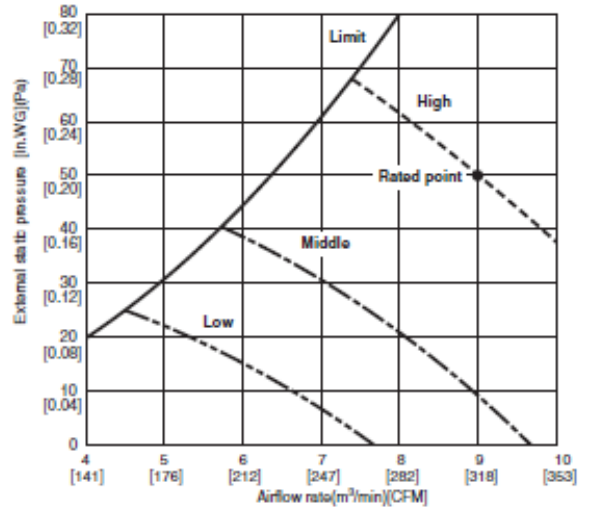
SEZ-KD09NA

(External static pressure 0.14[in.WG](35Pa)) 208/230V 60Hz



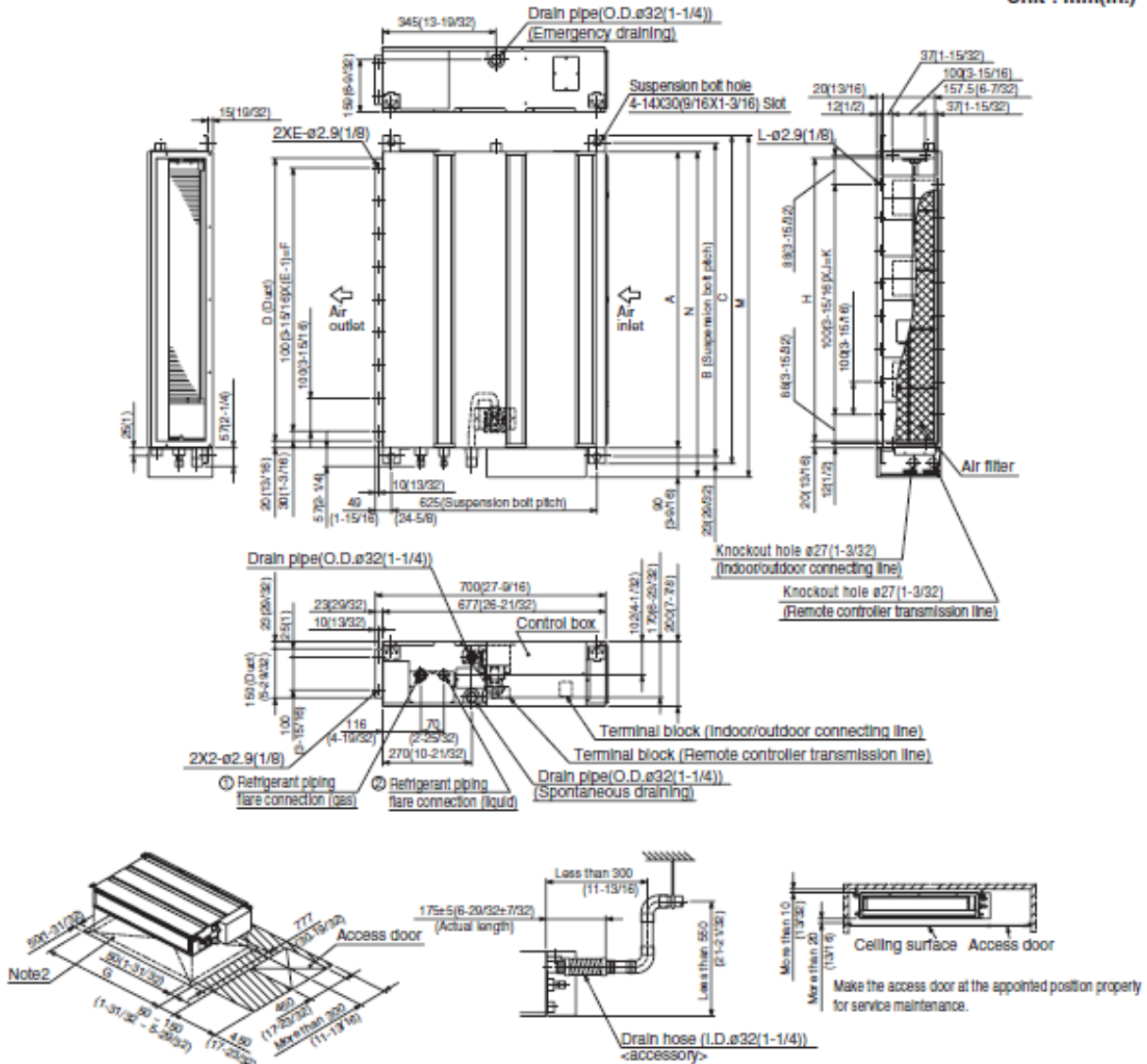
SEZ-KD09NA

(External static pressure 0.20[in.WG](50Pa)) 208/230V 60Hz



DIMENSIONS: SEZ-KD09NA

Unit : mm(in.)



Required space for service and maintenance

| Model | mm(in.) | | | | | | | | | | | ① Gas pipe | ② Liquid pipe | | |
|------------|-------------------|------------------|------------------|------------------|----|------------------|------------------|------------------|----|-------------------|----|------------------|------------------|------------------|------------------|
| | A | B | C | D | E | F | G | H | J | K | L | | | M | N |
| SEZ-KD09NA | 700 (27-9/16) | 752 (29-5/8) | 798 (31-3/8) | 660 (26) | 7 | 600 (23-5/8) | 800 (31-5/8) | 660 (26) | 5 | 500 (19-11/16) | 16 | 830 (32-11/8) | 790 (31-1/8) | $\phi 0.52(3/8)$ | $\phi 6.35(1/4)$ |
| SEZ-KD12NA | 900 (35-11/16) | 952 (37-1/2) | 998 (39-3/8) | 860 (33-7/8) | 9 | 800 (31-5/8) | 1000 (39-3/8) | 860 (33-7/8) | 7 | 700 (27-9/16) | 20 | 1030 (40-5/8) | 990 (39) | | |
| SEZ-KD15NA | 1100 (43-3/8) | 1152 (45-3/8) | 1198 (47-1/8) | 1060 (41-7/8) | 11 | 1000 (39-3/8) | 1200 (47-3/8) | 1060 (41-7/8) | 9 | 900 (35-3/8) | 24 | 1230 (48-3/8) | 1190 (46-7/8) | $\phi 12.7(1/2)$ | |
| SEZ-KD18NA | 1300 (51-1/8) | 1352 (53-1/8) | 1398 (55-1/8) | 1260 (49-7/8) | 13 | 1200 (47-3/8) | 1400 (55-1/8) | 1260 (49-7/8) | 11 | 1100 (43-3/8) | 28 | 1430 (56-3/8) | 1390 (54-7/8) | | |

- Note 1. Use M10 screw for the suspension bolt (field supply).
 2. Keep the service space for the maintenance at the bottom.
 3. This chart indicates for SEZ-KD15NA model, which has 3 fans. SEZ-KD09, 12NA models have 2 fans. SEZ-KD18NA models have 4 fans.
 4. In case an inlet duct is used, remove the air filter (supply with the unit), then install the filter (field supply) at suction side.



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LG SPLIT AIR CONDITIONER [INDOOR UNIT]**[RELATED SECTION 23 81 43]**

Model Number: LAN095HV

Location: Flex Space

Dimensions:

Width: 35-3/16" [770 mm]

Height: 11-1/8" [283 mm]

Depth: 6-1/2" [165 mm]

Features:

Weight: 23.1 lbs [10.5 kg]

Rated Voltage Indoor 230/208-60-1

Indoor dB: 38/35/32 A

Finish: PSAPECW10 Organic Cream White

High-wall duct-free

Cooling capacity: 9,200/8,900 BTUs

Heating capacity: 12,000/11,700 BTUs

Available: LG Electric





PRODUCTS

- PTAC
- Thru The Wall
- Duct Free
- Room Air Conditioner
- Floor Standing
- Ceiling Cassette
- WSHP**
- All Models
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LAN095HV

Innovative Comfort Solutions

The most comfortable airflow for the human body can be found in nature. After countless analysis, LG has applied the scientific Chaos theory to its Air Conditioning range, which effectively produces a natural, fresh breeze.

9,200 BTU Heat Pump Unit

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Features

- Inverter
- R-410A Refrigerant
- Plasma air purifying system
- Chaos Swing
- Self-cleaning indoor coil
- Auto changeover
- Jet Cool
- Cooling/Heating/Fan Mode
- Auto sleep mode
- Ultra-quiet operation
- Dehumidifying mode
- Auto restart
- 24-Hour on/off timer
- Built-in low ambient standard, down to 14°F (cooling mode)
- Manual power switch
- Defrost control
- Temperature display on indoor unit
- Evaporator frost control
- Energy Saving
- Gold Fin™ Anti-Corrosion

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HIGH WALL DUCT-FREE • ART COOL MINI-SPLIT SINGLE ZONE • INVERTER

9,000 BTUs

LA095HV (H/P Model)

- C** 9,200 BTUs Cooling
- H** 12,000 BTUs Heating



Standard Mirror
PSAPECR10



Organic Cream White
PSAPECW10



Art Flower Gold
PSAPECF10



Snow Flower White
PSAPECT10



FEATURES:

- Inverter
- R-410A Refrigerant
- Plasma air purifying system
- Chaos Swing
- Self-cleaning indoor coil
- Auto changeover
- Jet Cool
- Cooling/Heating/Fan Mode
- Auto sleep mode
- Ultra-quiet operation

- Dehumidifying mode
- Auto restart
- 24-Hour on/off timer
- Built-in low ambient standard, down to 14°F (cooling mode)
- Manual power switch
- Defrost control
- Temperature display on indoor unit
- Evaporator frost control

- Energy Saving
 - Gold Fin™ Anti-Corrosion
- Interior Unit Includes:**
- Wall unit
 - Installation plate & hardware
 - Remote control, batteries, holder & holder hardware
 - Installation manual
 - Standard mirror panel

Exterior Unit Includes:

- Exterior unit
- Exterior unit has sufficient refrigerant for charging indoor coil and a 25' line set (line set not included)

System Model # LA095HV

Indoor Model # LAN095HV

Outdoor Model # LAU095HV

Performance

Capacity (BTUs) **C** 9,200/8,900
H 12,000/11,700

SEER 19.7/19.1

Air Circulation (CFM H/M/L) 230/180/140

Fan Speeds 5/Auto/Chaos

Dehumidification (pts/hr) 2.6

Indoor dB(A)* 38/35/32

Outdoor dB(A)* 48

Electrical

Rated Voltage Outdoor 230/208-60-1

Rated Voltage Indoor 230/208-60-1

Indoor Dimensions 35 3/16 x

W x H x D (inches) 11 1/8 x
6 1/2

Weight (lbs.) 23.1

Outdoor Dimensions 30 5/16 x

W x H x D (inches) 21 5/16 x
9 5/8

Weight (lbs.) 83.8

Thermostat Range

Cooling / Heating (°F) 64-86/60-86

*LG verified sound ratings.

Warranty: 3 years parts; 5 years compressor.

See page 13 for electrical specifications, refrigerant line requirements & formulas. See page 21 for installation materials.



LG SPLIT AIR CONDITIONER [OUTDOOR UNIT]

[RELATED SECTION 23 81 43]

Model Number: LAU095HV

Location: Flex Mechanical Closet

Dimensions:

Width: 30-5/16" [786 mm]

Height: 21-5/16" [557 mm]

Depth: 9-5/8" [244 mm]

Features:

Weight: 83.8 lbs [38 kg]

Rated Voltage Outdoor 230/208-60-1

Outdoor dB: 48 A

Finish: PSAPECW10 Organic Cream White

High-wall duct-free

Cooling capacity: 9,200/8,900 BTUs

Heating capacity: 12,000/11,700 BTUs

Available: LG





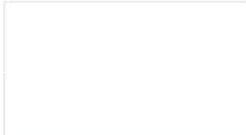
PRODUCTS

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- Thru The Wall
- Duct Free
- Room Air Conditioner
- Floor Standing
- Ceiling Cassette
- WSHP**
- All Models
- Multi-V

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Innovative Comfort Solutions

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9,200 BTU Heat Pump Unit.

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Features

- Inverter
- R-410A Refrigerant
- Plasma air purifying system
- Chaos Swing
- Self-cleaning indoor coil
- Auto changeover
- Jet Cool
- Cooling/Heating/Fan Mode
- Auto sleep mode
- Ultra-quiet operation
- Dehumidifying mode
- Auto restart
- 24-Hour on/off timer
- Built-in low ambient standard, down to 14°F (cooling mode)
- Manual power switch
- Defrost control
- Temperature display on indoor unit
- Evaporator frost control
- Energy Saving
- Gold Fin™ Anti-Corrosion

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HIGH WALL DUCT-FREE • ART COOL MINI-SPLIT SINGLE ZONE • INVERTER

9,000 BTUs

LA095HV (H/P Model)

- C** 9,200 BTUs Cooling
- H** 12,000 BTUs Heating



Standard Mirror
PSAPECR10



Organic Cream White
PSAPECW10



Art Flower Gold
PSAPECF10



Snow Flower White
PSAPECT10



FEATURES:

- Inverter
- R-410A Refrigerant
- Plasma air purifying system
- Chaos Swing
- Self-cleaning indoor coil
- Auto changeover
- Jet Cool
- Cooling/Heating/Fan Mode
- Auto sleep mode
- Ultra-quiet operation

- Dehumidifying mode
- Auto restart
- 24-Hour on/off timer
- Built-in low ambient standard, down to 14°F (cooling mode)
- Manual power switch
- Defrost control
- Temperature display on indoor unit
- Evaporator frost control

- Energy Saving
 - Gold Fin™ Anti-Corrosion
- Interior Unit Includes:**
- Wall unit
 - Installation plate & hardware
 - Remote control, batteries, holder & holder hardware
 - Installation manual
 - Standard mirror panel

Exterior Unit Includes:

- Exterior unit
- Exterior unit has sufficient refrigerant for charging indoor coil and a 25' line set (line set not included)

| | |
|-----------------------------|--|
| System Model # | LA095HV |
| Indoor Model # | LAN095HV |
| Outdoor Model # | LAU095HV |
| Performance | |
| Capacity (BTUs) | C 9,200/8,900 H 12,000/11,700 |
| SEER | 19.7/19.1 |
| Air Circulation (CFM H/M/L) | 230/180/140 |
| Fan Speeds | 5/Auto/Chaos |
| Dehumidification (pts/hr) | 2.6 |
| Indoor dB(A)* | 38/35/32 |
| Outdoor dB(A)* | 48 |
| Electrical | |
| Rated Voltage Outdoor | 230/208-60-1 |
| Rated Voltage Indoor | 230/208-60-1 |
| Indoor Dimensions | |
| W x H x D (inches) | 35 3/16 x 11 1/8 x 6 1/2 |
| Weight (lbs.) | 23.1 |
| Outdoor Dimensions | |
| W x H x D (inches) | 30 5/16 x 21 5/16 x 9 5/8 |
| Weight (lbs.) | 83.8 |
| Thermostat Range | |
| Cooling / Heating (°F) | 64-86/60-86 |

*LG verified sound ratings.

Warranty: 3 years parts; 5 years compressor.

See page 13 for electrical specifications, refrigerant line requirements & formulas. See page 21 for installation materials.



WALL MINI SPLIT CONDENSER BRACKET

[RELATED SECTION 23 81 43]

Model Number: CKB4

Location: HVAC Compartment

Dimensions:

Width: 43.3" [1100 mm]

Height: 23.8" [580 mm]

Depth: 17.7" [450 mm]

Features:

Maximum load: 300 lbs [140 kg]

Finish: ivory

Available: e-ComfortUSA

Price: \$130.00



Airtec CKB4 Wall Bracket for the Outdoor Unit



★★★★★ [Review It!](#)

Model: CKB4

Brand: **Airtec**

Availability: **In stock.** Ships within 3-5 days

Shipping: **Free Shipping**
on This Product

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QTY:

Your Price: \$130.00

+ Add to Cart

CKB4 Wall Bracket is used for the Mini Split Outdoor Units that weight more than 176 Lbs

Description

[Ask A Question](#)

Product Details

This wall bracket is used to mount the outside section of a mini-split system. **It will support condensers that weight more than 176 lbs.** For condenser that weight less than 176 Lbs use this Wall Bracket.

- [▶ Related Products](#)
- [▶ Related Categories](#)



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Type 2 Bracket

Part no: 60kg B6144 / 90kg B6145 / 140kg B6143

Dimensions:

| Size | Height | Width | Depth |
|-------|--------|--------|-------|
| 60kg | 430mm | 720mm | 370mm |
| 90kg | 530mm | 900mm | 470mm |
| 140kg | 580mm | 1100mm | 450mm |

Other Features:

- 3 sizes available:
60, 90, 140kg maximum load
- Self adjusting
- A high quality finish for the air conditioning and refrigeration industry
- Easy installation, boxed and complete with all necessary fixings
- All steelwork undergoes a 5-part phosphating pretreatment prior to a 60 micron powder coat finish in ivory
- Self adjusting brackets designed for quick installation and easy levelling on uneven wall surfaces



The BBJ Type 2 Condensing Unit Brackets are easy to install and benefit from a high quality finish.

They offer a professional appearance and highly economic solution for installations.

The self-adjusting Type 2 Brackets are designed for quick installation and easy levelling on uneven wall surfaces.

The sturdy and secure Brackets offer horizontal flexibility. They are designed for easy installation and are boxed complete with all necessary fixings.

DIVISION 25 **INTEGRATED
AUTOMATED**

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – 5 SLOT BASE

[RELATED SECTION 25 13 00]

Model Number: P3-05B

Location: Main House Mechanical Closet

Dimensions:

Length: 11-1/4" [286 mm]

Width: 4-3/4" [121 mm]

Height: 6" [152 mm]

Weight: 26.5 oz [752 g]

Features:

Operating Temperature: 32 to 140°F

Storage Temperature: -4 to 158°F

Approval Certificates:

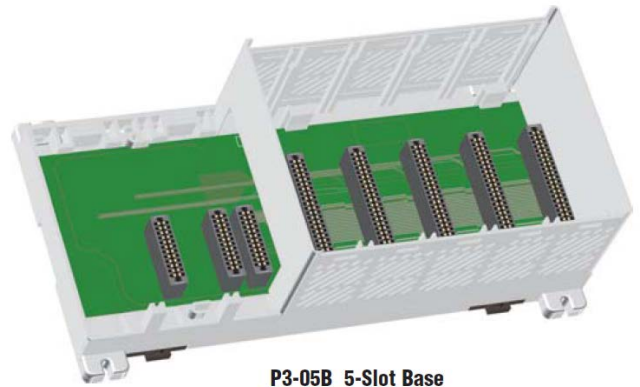
508 file E157382

UL Safety Approval (UL1604 file E200031)


CE: EN61121-2

Meets EMC and Safety requirements

Available: Automation Direct



P3-05B 5-Slot Base

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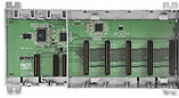
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You are looking at: [Programmable Controllers](#) > [Productivity3000 \(Programmable Automation Controller\)](#) > [Bases & Expansions](#) > **P3-05B**

Products | **Reviews**

P3-05B



 larger image

There are no reviews for this item.
 Be the first to [write a review...](#)

5-slot local / expansion / remote base, P3-01AC or P3-01DC power supply required, holds 5 I/O modules (CPU, -EX or -RS does NOT consume a slot)

[View product insert.](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.




[Download your free Productivity3000 PAC Programming Software.](#)

Review the [Productivity3000 programming online help.](#)


NEW Let us assemble a Productivity3000 system for you. Instead of adding individual components here, go to our [P3000 Configuration Tool](#), create your system, choose "Assemble this system for me" button, we will add it to your cart as a unit and for a nominal fee we will ship it pre-assembled.


P3-05B

Documentation Links

[Specifications](#) 

[Online Manual](#)

[AutoCAD Drawings](#) 





[3D Model](#) 

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Agency Approval Checklist
 (CE/UL/CUL/CSA/RoHS docs)

Item Shipping Weight: 1.7 lbs.
 MADE IN TAIWAN
 HS Code: 8538.10










| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|---|---------------|--------------------------------|--|---|---|
| P3-05B | 5-SLOT I/O BASE, PRODUCTIVITY3000 BASE  | \$179.00 | <input type="text" value="0"/> |  IN |  |  |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

[Update](#)

Recommended Items

The following items are recommended by Automationdirect for purchase with a P3-05B

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|---------------------------|--|---------------|--------------------------------|---|---|
| P3-550 | 266 MHZ CPU WITH 4x10 LCD, PRODUCTIVITY3000 CPU | \$599.00 | <input type="text" value="0"/> |  |  |
| P3-01AC | POWER SUPPLY, 100 TO 240 VAC, PRODUCTIVITY 3000 POWER SUPPLY | \$190.00 | <input type="text" value="0"/> |  |  |
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | <input type="text" value="0"/> | NA |  |
| P3-PGMSW | PRODUCTIVITY3000 PROGRAMMING SOFTWARE, LADDER LOGIC EDITOR | \$495.00 | <input type="text" value="0"/> |  |  |

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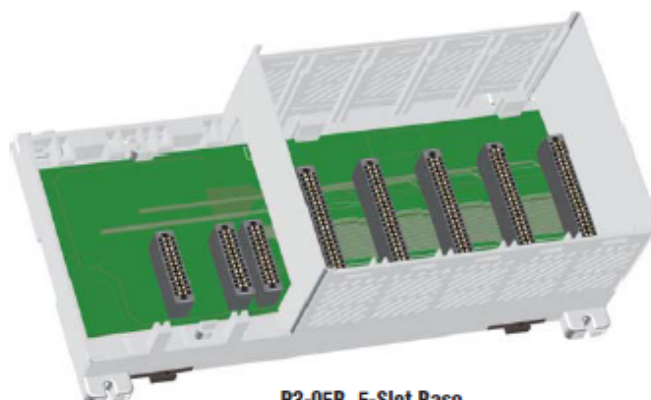
Bases

[P3-03B](#) <--->

[P3-05B](#) <--->

[P3-08B](#) <--->

[P3-11B](#) <--->



P3-05B 5-Slot Base

The [P3-03B](#), [P3-05B](#), [P3-08B](#), and [P3-11B](#) are 3, 5, 8, and 11-slot, local, expansion, and remote I/O bases.

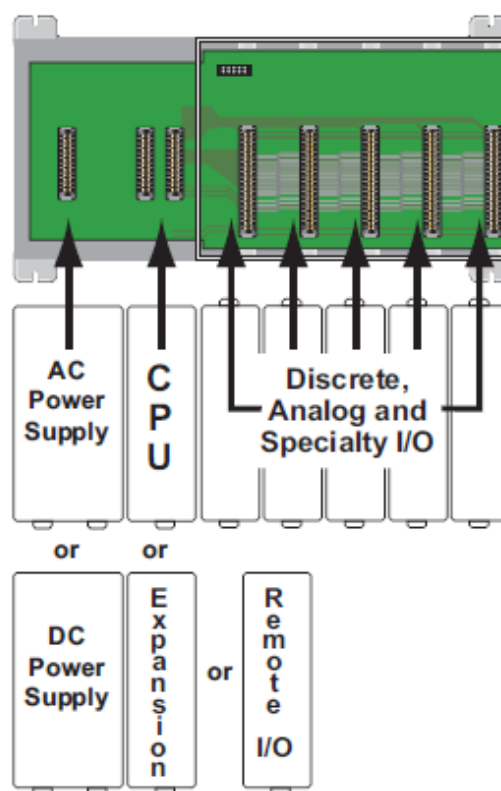
See Dimensions and Installation for base dimensions.

| Base Specifications | |
|----------------------------------|--|
| Input or Output Modules per Base | 3, 5, 8, or 11 |
| Power Supply Slots | 1 (P3-01AC or P3-01DC) |
| CPU Slots | 1 (P3-550, P3-RS and P3-EX compatible) |
| Module Types Supported | Discrete, analog and specialty |
| Module Placement Restrictions | None. Any I/O module may be installed in any I/O slot without power supply budget or module type restrictions. |
| I/O Module Hot Swap Support | Yes. (All discrete and analog modules can be software enabled for Hot Swap operation) |
| Module Keying | Electronic to slot |
| Maximum Number of Local Bases | 5 |

| General Specifications | |
|------------------------|---|
| Operating Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Heat Dissipation | 2.5W |
| Agency Approvals | UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2*) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only. |
| Weight | P3-03B : 1.365 lbs (21.8oz.), 619g P3-05B : 1.658 lbs (26.5oz.), 752g P3-08B : 2.158 lbs (34.5oz.), 978g P3-11B : 2.682 lbs (42.9oz.), 1216g |

*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

Base Configuration



Dimensions and Installation

It is important to review and understand the installation requirements for your Productivity3000 system. Your knowledge of these requirements will help ensure that your system operates within its environmental and electrical limits.

Plan for Safety

This catalog should never be used as a replacement for the product inserts and user manual. Each base, CPU, power supply, I/O module, remote slave, and expansion module comes with a product insert. You can purchase, download for free, or view online the Productivity3000 user manual ([P3-USER-M](#)). These documents, along with the software help files, contain important safety information that must be followed.

The system installation should comply with all appropriate electrical codes and standards.

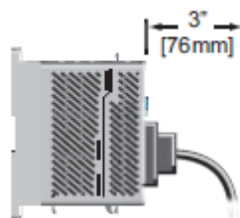
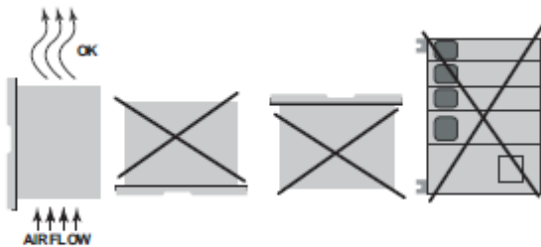
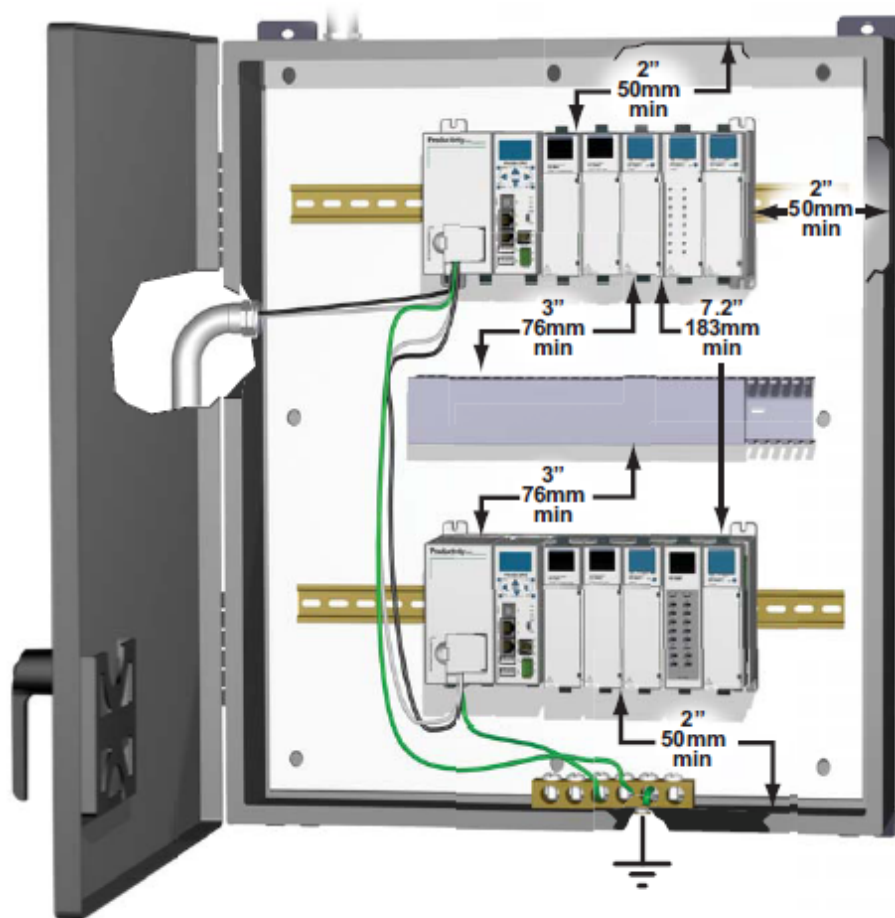
Enclosures

Your selection of a proper enclosure is important to ensure safe and proper operation of your Productivity3000 system. Applications for the Productivity3000 system vary and may require additional hardware considerations. The minimum considerations for enclosures include:

- Conformance to electrical standards
- Protection from the elements in an industrial environment
- Common ground reference
- Maintenance of specified ambient temperature
- Access to the equipment
- Security or restricted access
- Sufficient space for proper installation and maintenance of the equipment

Mounting Position

Mount the bases horizontally, as shown in the illustration, to provide proper ventilation. Do not mount the bases vertically, upside down, or on a flat horizontal surface.



NOTE: Add 3 inches (76 mm) to mounting depth when using ZIPLink cable [ZL-CBL40](#).

Dimensions and Installation

Mounting Clearances

Provide a minimum clearance of 2 inches (50mm) between the bases and all sides of the enclosure. Allow extra door clearance for operator panels and other door mounted items. There should be a minimum of 3 inches (76mm) clearance between the base and any wire duct, and a minimum of 7.2 inches (183mm) from base to base in a multiple base installation.

Grounding

A good common ground reference (earth ground) is essential for proper operation of the Productivity3000 system. One side of all control circuits, power circuits and the ground lead must be properly connected to earth ground by either installing a ground rod in close proximity to the enclosure or by connecting to the incoming power system ground. There must be a single-point ground (i.e. copper bus bar) for all devices in the enclosure that require an earth ground.

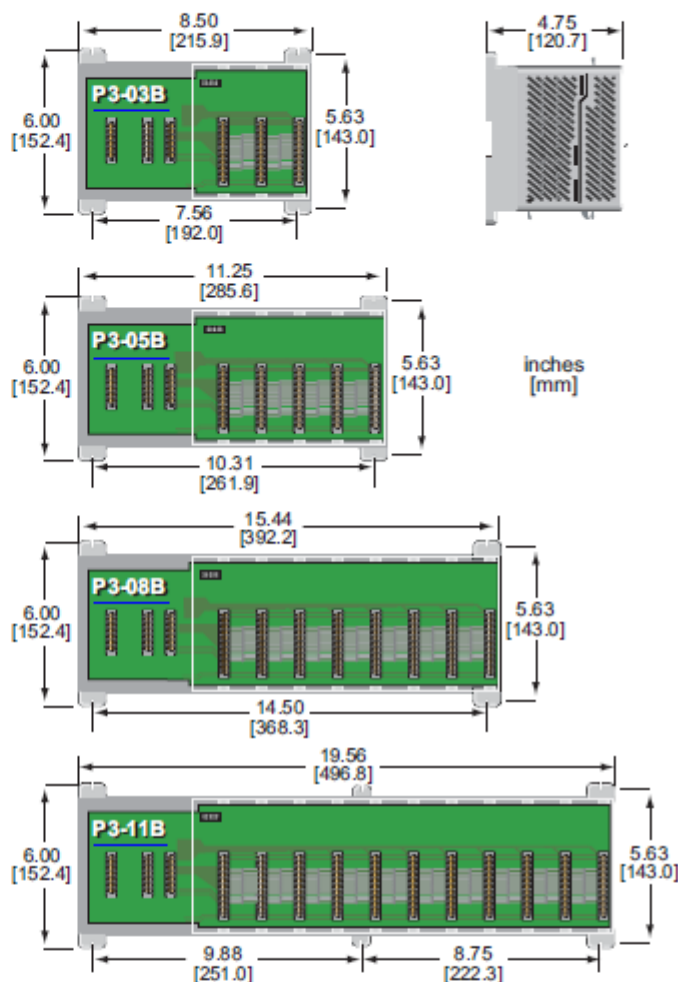
Temperature Considerations

The Productivity3000 system should be installed within the operating temperature specifications as listed in this document. If the temperature deviates above or below the specification, measures such as cooling or heating the enclosure should be taken to maintain the specification.

Power Considerations

The Productivity3000 system is designed to be powered by 110/220 VAC or 24/48 VDC via one of the P3000 power supplies. The Productivity3000 has achieved CE certification without requiring EMF/RFI line noise filters on the AC power supply. Please review the "EU Directives" document, located in the User Manual or at www.productivitypac.com, for applications which require CE Compliance.

Base Dimensions



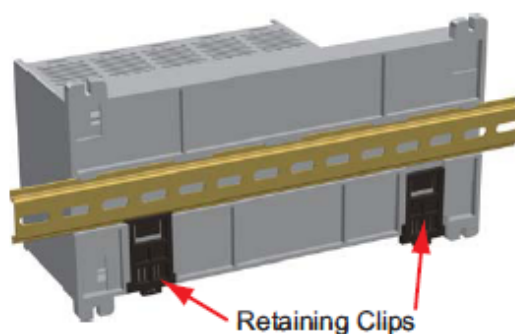
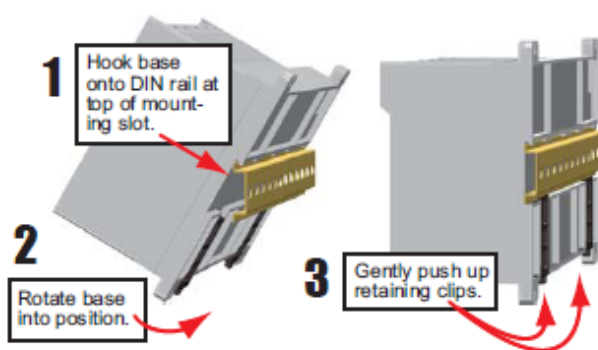
Base Installation

Using Mounting Rails

The Productivity3000 bases can be secured to the cabinet using mounting rails. You should use rails that conform to DIN EN standard 50 022. We offer a complete line of DIN rail, DINnectors and DIN rail mounted apparatus. These rails are approximately 35mm high, with a depth of 7.5mm. If you mount the base on a rail, you should also consider using end brackets on each side of the base. The end brackets help keep the base from sliding horizontally along the rail. This helps minimize the possibility of accidentally pulling the wiring loose.

If you examine the bottom of the base, you'll notice retaining clips. To secure the base to a DIN rail, place the base onto the rail and gently push up on the retaining clips. The clips lock the base onto the rail.

To remove the base, pull down on the retaining clips, slightly lift up the base, and pull it away from the rail.



AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – CPU MODULE**[RELATED SECTION 25 13 00]**

Model Number: P3-550

Location: Main House Mechanical Closet

Dimensions:

Length: 11-1/4" [286 mm]

Width: 4-3/4" [121 mm]

Height: 6" [152 mm]

Weight: 9 oz [260 g]

Features:

User memory: 50 MB

Memory type: flash and battery backed RAM

Operating Temperature: 32 to 140°F

Storage Temperature: -4 to 158°F

Approval Certificates:

508 file E157382

UL Safety Approval (UL1604 file E200031)


CE: EN61121-2

Meets EMC and Safety requirements

Available: Automation Direct



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You are looking at: [Programmable Controllers](#) > [Productivity3000 \(Pr...](#) > [CPUs \(Remote & Expansion\)](#) > **P3-550**

Products **Reviews**



larger image

Overall Score - 4.3 out of 5
 (5 reviews / 5 comments)

[read reviews](#) [write a review](#)

P3-550

Productivity3000 266 MHz CPU, 50 Mbyte total available user memory, installs in the CPU slot of the first base in the local base group. Includes: Real time clock/calendar, 4x10 character high quality LCD, two serial communications ports: (1) RS-232 (RJ12), (1) RS-485 (3-wire terminal block), both supporting Modbus RTU Master/Slave and ASCII In/Out up to 115.2 kbaud rate; two 10/100 Mbps Ethernet ports: (1) for connecting the remote slave to the CPU, (1) Modbus TCP/IP for programming and monitoring as well as communications to any Modbus TCP enabled device; three USB communication ports: (1) USB A for Expansion I/O, (1) USB A for program transfer and data logging via removable drive, and (1) USB B for programming.

[View product insert.](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.

[Download your free Productivity3000 PAC Programming Software.](#)

Review the [Productivity3000 programming online help.](#)

NEW Let us assemble a Productivity3000 system for you. Instead of adding individual components here, go to our [Productivity3000 Configuration Tool](#), create your system, choose "Assemble this system for me" button, we will add it to your cart as a unit and for a nominal fee we will ship it pre-assembled.

P3-550

Documentation Links

[Specifications](#)

[Online Manual](#)

[AutoCAD Drawings](#)




[3D Model](#)

[Frequently Asked Questions](#)

[Agency Approval Checklist](#)
 (CE/UL/CUL/CSA/RoHS docs)

Item Shipping Weight: 1.1 lbs.
 MADE IN TAIWAN
 HS Code: 8537.10












| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|---|---------------|--------------------------------|--|---|---|
| P3-550 | 266 MHZ CPU WITH 4x10 LCD, PRODUCTIVITY3000 CPU | \$599.00 | <input type="text" value="0"/> |  IN |  |  |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

[Update](#)

Recommended Items

The following items are recommended by Automationdirect for purchase with a P3-550

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|---------------------------|--|---------------|--------------------------------|---|---|
| P3-01AC | POWER SUPPLY, 100 TO 240 VAC, PRODUCTIVITY 3000 POWER SUPPLY | \$190.00 | <input type="text" value="0"/> |  |  |
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | <input type="text" value="0"/> | NA |  |
| P3-03B | 3-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$149.00 | <input type="text" value="0"/> |  |  |
| P3-05B | 5-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$179.00 | <input type="text" value="0"/> |  |  |
| P3-08B | 8-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$229.00 | <input type="text" value="0"/> |  |  |

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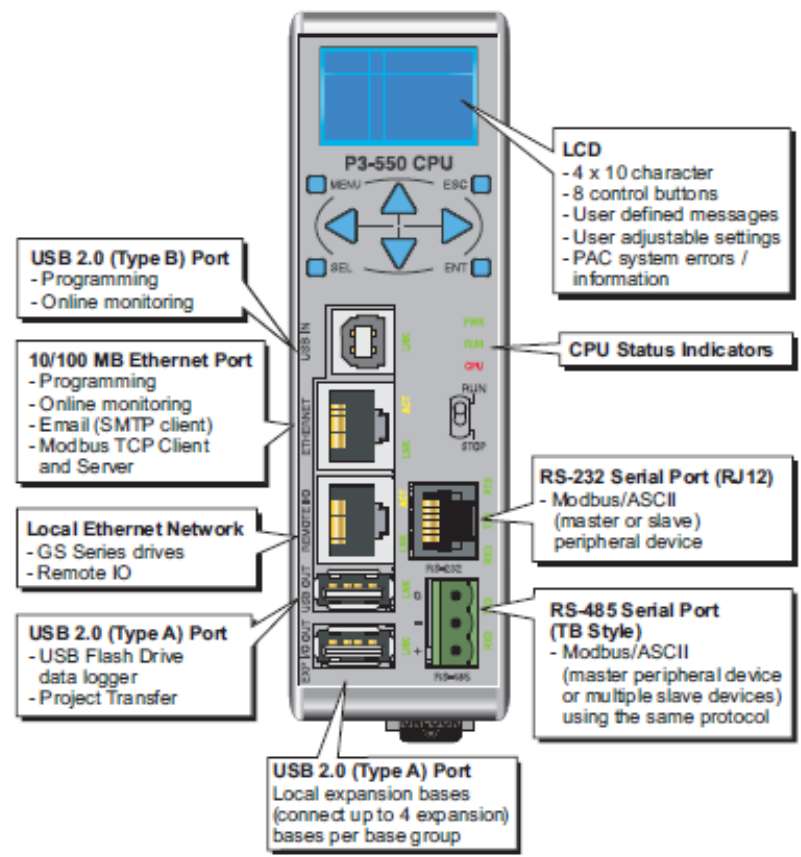
P3-550 CPU Module

P3-550 <--->

The P3-550 is a full-featured, high-performance CPU. Features include a 4 line x 10 character LCD and seven communications ports which support USB, Ethernet and serial devices.

Each Productivity3000 system requires one CPU module mounted in the controller slot in the first base of the local base group. The CPU stores and executes the user's program.

The system can be expanded with the P3-RS or P3-EX modules. The local, expansion, and remote I/O are assigned preconfigured or user-defined tag names which can be easily referenced in the ladder logic program.



| CPU Status Indicators | |
|-----------------------|--|
| PWR | Green LED is illuminated when power is on |
| RUN | Green LED is illuminated when CPU is in RUN mode |
| CPU | Red LED is illuminated during power on reset, power down, or watch-dog time-out. |



| CPU Run/Stop Switch | |
|---------------------|---|
| RUN position | Executes user program, run-time edits possible |
| STOP position | Does not execute user program, normal program load position |

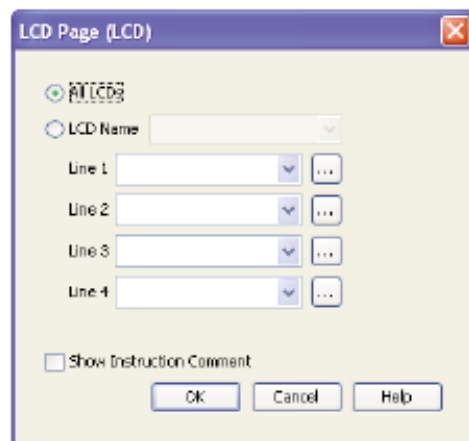
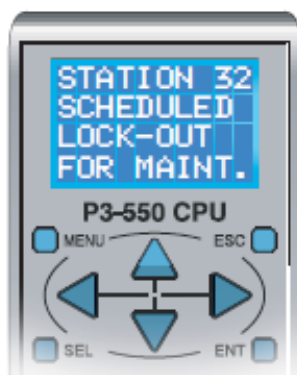
P3-550 CPU Module

LCD Message Display

The CPU incorporates a 4 line x 10 character LCD Display for system alarms and information or for displaying user-defined messages.

LCD control buttons located beneath the display allow the user to navigate through a menu, and arrow buttons allow for configuration of time and date settings.

For user-defined messages, the display is configured using the Productivity Suite Programming Software. An LCD Page instruction allows the user to program text into user-defined tags and display the messages based on the ladder execution.



Specifications

| CPU Specifications | | | | | | | | | | | | | | | |
|------------------------------------|---|-----------------------|-----|-----------------|-----------------|-----------------|------------------|----------------|------------------|---------------|----------|-----------------|------|----------------|--|
| User Memory | 50MB (Includes program, data and documentation) | | | | | | | | | | | | | | |
| Memory Type | Flash and Battery Backed RAM | | | | | | | | | | | | | | |
| Retentive Memory | 100K | | | | | | | | | | | | | | |
| Scan Time | 600µs (3K Boolean, 1K I/O) | | | | | | | | | | | | | | |
| Display | LCD, 4x10 characters, backlit, 8 control buttons; LCD characters are 5x7 with a dot pitch of 0.45mm; 2.25mm x 3.15mm | | | | | | | | | | | | | | |
| Communications; 7 Integrated Ports | USB IN: Programming, Monitoring, Debug, Firmware ETHERNET: (10/100Mbps Ethernet) Programming, Monitoring, Debug, Firmware, Email SMTP Client, Modbus TCP Master (64 Slaves) and Slave (8 Masters) REMOTE I/O: (10/100Mbps Ethernet) 32 P3-RS Remote Base Groups, and 64 GS-EDRV (GS Drives) USB OUT: (2.0) Data Logging or Project Transfer using SDCZ4-2048-A10 Pen Drive EXP I/O OUT: (2.0 Proprietary) 4 P3-EX Local Expansion Bases RS-232: (RJ12, 1200-115.2k Baud) ASCII, Modbus RS-485: Removable Terminal Included, (1200-115.2k Baud) ASCII, Modbus | | | | | | | | | | | | | | |
| Hardware Limits of System | 33 Base Groups 1 Local (P3-550) + 32 Remote (P3-RS) 5 Bases per Base Group 1 P3-550 or P3-RS + 4 Expansion (P3-EX) 165 Bases Total 1 P3-550, 32 P3-RS, & 132 P3-EX 116,160 Hardware I/O Points (All 64-point I/O Modules) 64 GS Series Drives as Remote I/O | | | | | | | | | | | | | | |
| Instruction Types | <table border="0"> <tr> <td>Application Functions</td> <td>PID</td> </tr> <tr> <td>Array Functions</td> <td>Program Control</td> </tr> <tr> <td>Counters/Timers</td> <td>String Functions</td> </tr> <tr> <td>Communications</td> <td>System Functions</td> </tr> <tr> <td>Data Handling</td> <td>Contacts</td> </tr> <tr> <td>Drum Sequencers</td> <td>Coil</td> </tr> <tr> <td>Math Functions</td> <td></td> </tr> </table> | Application Functions | PID | Array Functions | Program Control | Counters/Timers | String Functions | Communications | System Functions | Data Handling | Contacts | Drum Sequencers | Coil | Math Functions | |
| Application Functions | PID | | | | | | | | | | | | | | |
| Array Functions | Program Control | | | | | | | | | | | | | | |
| Counters/Timers | String Functions | | | | | | | | | | | | | | |
| Communications | System Functions | | | | | | | | | | | | | | |
| Data Handling | Contacts | | | | | | | | | | | | | | |
| Drum Sequencers | Coil | | | | | | | | | | | | | | |
| Math Functions | | | | | | | | | | | | | | | |

| General Specifications | |
|------------------------|---|
| Operating Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Heat Dissipation | 7W |
| Enclosure Type | Open Equipment |
| Agency Approvals | UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only. |
| Module Location | Controller slot in the local base in a Productivity3000 System |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at: www.productivitypac.com |
| Weight | 260g (9 oz) |

*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

IMPORTANT!



Hot-Swapping Information

Note: This device cannot be Hot Swapped.

P3-550 CPU Module

Battery (Optional)

A battery is included with the [P3-550 CPU](#), but is not installed. The battery can be installed to retain the Time and Date along with any Tagname values that are set up as retentive.

The battery is not needed for program backup.

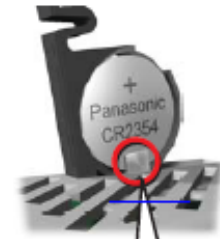
Step One:

Press spring lock and swing battery compartment away from CPU.



Step Two:

Insert battery and close compartment.



Take care to insert battery behind metal tab.

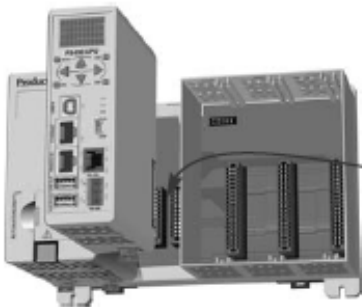
Battery (Optional)

| | |
|----------|---|
| D2-BAT-1 | Coin type, 3.0V Lithium battery, 560mA, battery number CR2354 |
|----------|---|

CPU Installation

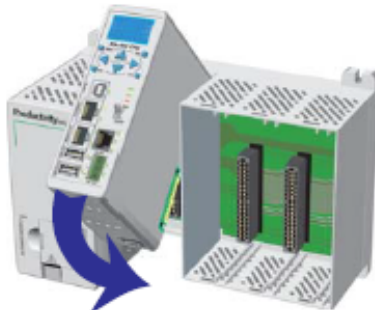
Step One:

Locate the two sockets next to the power supply; the CPU will be inserted into this location.



Step Two:

Insert the CPU at a 45° angle into the notch located at the top of the base and rotate down until seated.



Step Three:

Snap retaining tab into the locked position.

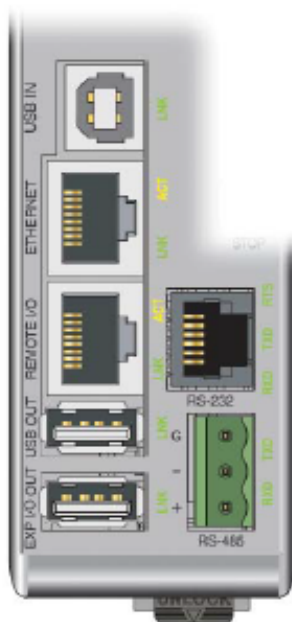


WARNING: Explosion hazard – Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous. Do not hot swap.

P3-550 CPU Module - Communications

Port Specifications

The P3-550 CPU has seven communications ports. The following pages list specifications and pin-out diagrams for these ports.

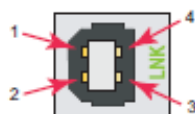


USB IN Port

Used exclusively for connecting to a PC running the Productivity Suite programming software.

USB Type B Slave Input Specifications

| Port Name | USB IN |
|-----------------|---|
| Description | Standard USB 2.0 Slave input for programming and online monitoring, with built-in surge protection. Not compatible with older full speed USB devices. |
| Transfer Rate | 480 Mbps |
| Port Status LED | Green LED is illuminated when LINK is established to programming software. |
| Cables | USB Type A to USB Type B: 3 ft. cable part # USB-CBL-AB3 6 ft. cable part # USB-CBL-AB6 10 ft. cable part # USB-CBL-AB10 15 ft. cable part # USB-CBL-AB15 |



Mating face of USB type B female

| Pin # | Signal |
|-------|--------|
| 1 | +5 |
| 2 | -Data |
| 3 | +Data |
| 4 | GND |

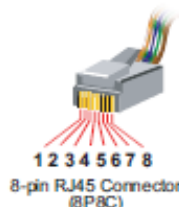
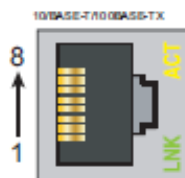
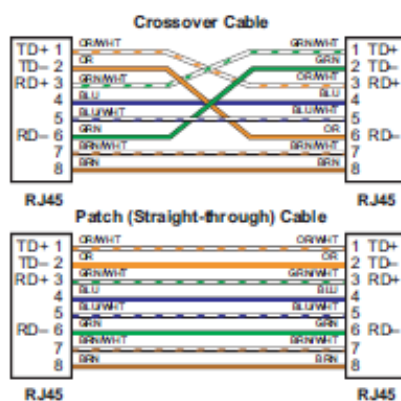
Ethernet Port

RJ-45 style connector used for:

- Connection to a PC running the Productivity Suite programming software
- Modbus TCP Client connections (Modbus requests sent from the [P3-550](#))
- Modbus TCP Server connections (Modbus requests received by the [P3-550](#))
- Outgoing E-mail

Remote I/O Port

RJ-45 style connector used for connecting to a Remote I/O network consisting of [P3-RS](#) Remote Slaves and/or [GS-EDRV](#) units with GS drives.

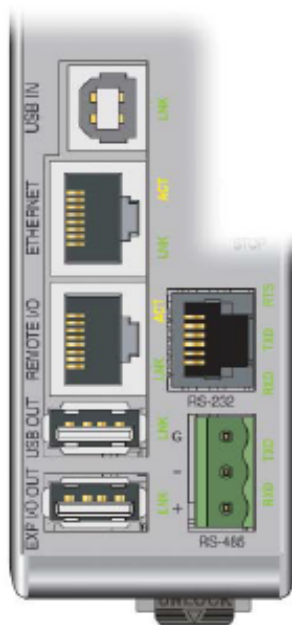


Ethernet Specifications

| Port Name | ETHERNET | REMOTE I/O |
|-----------------|---|--|
| Description | Standard transformer isolated Ethernet port with built-in surge protection for programming, online monitoring, Email (SMTP client) and Modbus/TCP client/server connections (fixed IP or DHCP). | Standard transformer isolated Ethernet port with built-in surge protection for connection to the P3-RS Remote I/O system. Supports 32 Remote I/O slaves and 64 GS Series Drives. |
| Transfer Rate | 10/100 Mbps | |
| Port Status LED | Green LED illuminated when network LINK is established. Yellow LED is illuminated when port is active (ACT). | |
| Cables | Use a Patch (straight through) cable when a switch or hub is used. Use a Crossover cable (not offered by ADC) when a switch or hub is not used. | |

P3-550 CPU Module - Communications

Port Specifications



USB OUT Port

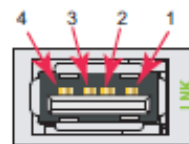
Used for data logging or project transfers to and from a [SDCZ4-2048-A10](#) Pen Drive.

EXP I/O OUT Port

USB port used only for Expansion I/O connections to local P3-EX modules in a Productivity3000 base with I/O.

USB Type A Master Output Specifications

| Port Name | USB OUT | EXP I/O OUT |
|-----------------|---|---|
| Description | Standard USB 2.0 Master output for connection to high-speed Flash drive (Sandisk SDCZ4-2048-A10) for data logging or program transfer with built-in surge protection. Not compatible with older full speed USB devices. A 0.5m male-to-female "port extender" cable is included to assist with Flash drive connection. | Proprietary USB 2.0 Master output for connection with up to four P3-EX local expansion bases, with built-in surge protection. |
| Transfer Rate | 480 Mbps | |
| Port Status LED | Green LED is illuminated when LINK is established to connected device | |
| Cables | None required | USB Type A to USB Type B: 6 ft. cable part # P3-EX-CBL6 (included with P3-EX module) |



Mating face of USB type A female

USB OUT

| Pin # | Signal |
|-------|--------|
| 1 | +5 |
| 2 | - Data |
| 3 | + Data |
| 4 | GND |

EXP I/O OUT

| Pin # | Signal |
|-------|--------|
| 1 | Reset |
| 2 | - Data |
| 3 | + Data |
| 4 | GND |

RS-232 Port

RJ-12 style connector used for:

- Modbus RTU Master connections
- Modbus RTU Slave connections
- ASCII Incoming and Outgoing communications
- Custom Protocol Incoming and Outgoing communications



6-pin RJ12 Female Modular Connector

| Pin # | Signal |
|-------|--------------------|
| 1 | GND Logic Ground |
| 2 | +5V 210 mA Maximum |
| 3 | RXD RS-232 Input |
| 4 | TXD RS-232 Output |
| 5 | RTS RS-232 Output |
| 6 | GND Logic Ground |

RS-232 Specifications

| Port Name | RS-232 |
|---------------------------------|--|
| Description | Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection. |
| Data Rates | Selectable, 1200, 2400, 9600, 19200, 33600, 38400, 57600, and 115200. |
| +5V Cable Power Source | 210mA maximum at 5V, +/- 5%. Reverse polarity and overload protected. |
| TXD | RS-232 Transmit output |
| RXD | RS-232 Receive input |
| RTS | Handshaking output for modem control. |
| GND | Logic ground |
| Maximum Output Load (TXD/RTS) | 3K Ω , 1,000pf |
| Minimum Output Voltage Swing | +/-5V |
| Output Short Circuit Protection | +/-15mA |
| Port Status LED | Green LED is illuminated when active for TXD, RXD and RTS |
| Cable Options | D2-DSCBL USB-RS232 with D2-DSCBL FA-CABKIT FA-ISOCAN for converting RS-232 to isolated RS-485 |

P3-550 CPU Module - Communications

Port Specifications

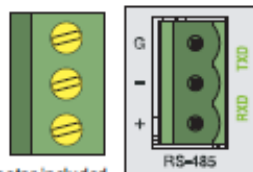
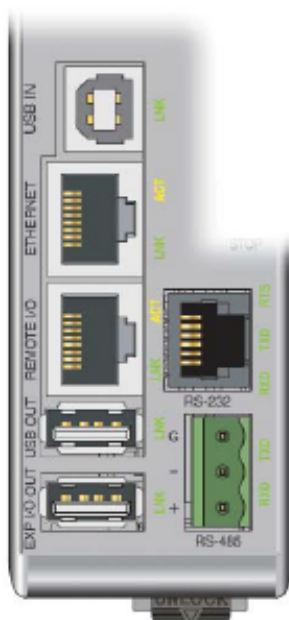
RS-485 Port

A 3-pin removable terminal block used for:

- Modbus RTU Master connections
- Modbus RTU Slave connections
- ASCII Incoming and Outgoing communications
- Custom Protocol Incoming and Outgoing communications

Removable connector included. Spare connectors available (part no. [P3-RS485CON](#)).

| RS-485 Port Specifications | |
|--------------------------------------|---|
| Port Name | RS-485 |
| Description | Non-isolated RS-485 port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD/EFT protection and automatic echo cancellation when transmitter is active. |
| Data Rates | Selectable, 1200, 2400, 9600, 19200, 33600, 38400, 57600, and 115200. |
| TXD+/RXD+ | RS-485 transceiver high |
| TXD-/RXD- | RS-485 transceiver low |
| GND | Logic ground |
| Input Impedance | 19K Ω |
| Maximum load | 50 transceivers, 19K Ω each, 60 Ω termination |
| Output Short Circuit Protection | +/- 250mA, thermal shut-down protection |
| Electrostatic Discharge Protection | +/-8KV per IEC1000-4-2 |
| Electrical Fast Transient Protection | +/-2KV per IEC1000-4-4. |
| Minimum Differential Output Voltage | 1.5V with 60 Ω load |
| Fail safe inputs | Logic high input state if inputs are unconnected |
| Maximum Common Mode Voltage | -7.5V to 12.5V. |
| Port Status LED | Green LED illuminated when active for TXD and RXD |
| Cable Options | Recommend Belden #9841 or equivalent |



| Pin # | Signal |
|-------|-----------|
| G | GND |
| - | TXD-/RXD- |
| + | TXD+/RXD+ |

Removable connector included. Spare connectors available (part no. [P3-RS485CON](#)).

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – AC POWER SUPPLY

[RELATED SECTION 25 13 00]

Model Number: P3-01AC

Location: Main House Mechanical Closet

Weight: 12.1 oz [365 g]

Features:

Input Voltage Range: 100-240 VAC [-15% /+10%]

Rated Operating Frequency: 50 - 60 Hz with \pm 5% tolerance

Maximum Input Power: 72W

Approval Certificates:

UL Safety Approval (UL508 file E157382 and UL1604 file E200031)

CE: EN61121-2

Meets EMC and Safety requirements

Available: Automation Direct

Price: \$190.00



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P3-01AC

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Productivity3000 100-240 VAC base power supply unit (one AC or DC power supply required per base)

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Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.

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NEW Let us assemble a Productivity3000 system for you. Instead of adding individual components here, go to our [Productivity3000 Configuration Tool](#), create your system, choose "Assemble this system for me" button, we will add it to your cart as a unit and for a nominal fee we will ship it pre-assembled.

P3-01AC

Documentation Links

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[Online Manual](#)

[AutoCAD Drawings](#)

[3D Model](#)

[Frequently Asked Questions](#)

[Agency Approval Checklist](#)
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Item Shipping Weight: 1.3 lbs.
MADE IN TAIWAN
HS Code: 8504.40

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| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|--|---------------|----------|--------------|-------|---------|
| P3-01AC | POWER SUPPLY, 100 TO 240 VAC, PRODUCTIVITY 3000 POWER SUPPLY | \$190.00 | 0 | IN | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

[Update](#)

Recommended Items

The following items are recommended by Automationdirect for purchase with a P3-01AC

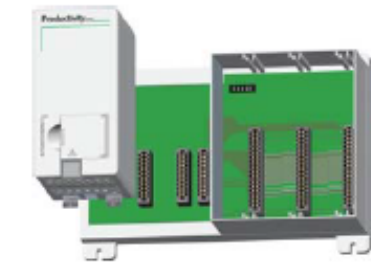
| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|---------------------------|--|---------------|----------|-------|---------|
| P3-01AC | POWER SUPPLY, 100 TO 240 VAC, PRODUCTIVITY 3000 POWER SUPPLY | \$190.00 | 0 | | |
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | 0 | NA | |
| P3-03B | 3-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$149.00 | 0 | | |
| P3-05B | 5-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$179.00 | 0 | | |
| P3-08B | 8-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$229.00 | 0 | | |
| P3-11B | 11-SLOT I/O BASE, PRODUCTIVITY3000 BASE | \$279.00 | 0 | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

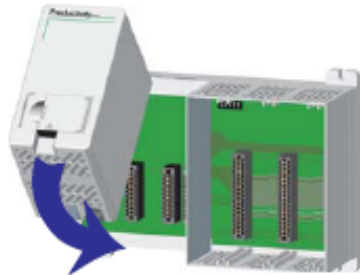
[Update](#)

Power Supplies

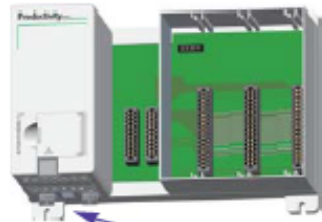
Power Supply Installation



Step One:
Locate the left most socket in the base.



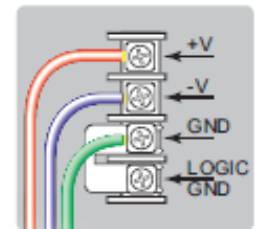
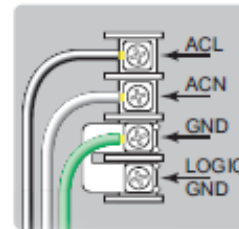
Step Two:
Insert the Power Supply at a 45° angle into the notch located at the top of the base and rotate down until seated in socket.



Step Three:
Snap the two retaining tabs into the locked position.

WARNING: Explosion hazard – Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous. Do not hot swap.

Power Connections



Grounding

A good common ground reference (earth ground) is essential for proper operation of the Productivity3000 system. One side of all control circuits, power circuits and the ground lead must be properly connected to earth ground by either installing a ground rod in close proximity to the enclosure or by connecting to the incoming power system ground. There must be a single-point ground (i.e. copper bus bar) for all devices in the enclosure that require an earth ground.

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – DC INPUT MODULES

[RELATED SECTION 25 13 00]

Model Number: P3-08ND3S

Location: Main House Mechanical Closet

Features:

Inputs per Module: 8 Sinking/ Sourcing

Status Indicators: Logic Side [8 points]

Terminal Type: 20-Position removable terminal lock

Commons: 8 Isolated [1point/ common]

Electrical:

Operating Voltage Range: 12-24 VDC [+/- 10%]

Peak Voltage: 26.4 VDC

Input Current

5 mA at 12 VDC

11 mA at 24 VDC

Maximum Input Current @ Temperature: 12.5 mA @ 60°C

On Voltage Level: >10 VDC

Off Current: <3 VDC

Minimum On Current: 4 mA

Maximum Off Current: 2 mA

Approval Certificates:

UL Safety Approval

CE

Available: Automation Direct


Price: \$68.00



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P3-08ND3S



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8-point, 12-24 VDC sinking or sourcing input module, 8 commons (isolated). Requires removable terminal block (sold separately, P3-RTB); optional ZIPLink connector modules and pre-wired cables are available.

(1) P3-RTB or a ZIPLink is required with each Productivity3000 Discrete and Analog I/O module under 32 pts.

[View product insert](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.

[Download your free Productivity3000 PAC Programming Software](#)

Review the [Productivity3000 programming online help](#)

To help select the proper ZipLink cables and modules, view our [Productivity3000 ZipLink Selection Chart](#)

P3-08ND3S

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[Online Manual](#)

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Item Shipping Weight: 0.4 lbs.
MADE IN CHINA
HS Code: 8537.10

There are no reviews for this item.
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| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|--|---------------|----------|--------------|-------|---------|
| P3-08ND3S | 8PT ISOLATED SINK/SOURCE IN, 12-24VDC, PRODUCTIVITY3000 DC INPUT MODULE I/O connector required (ZipLink or terminal block - P3-RTB). Order separately. | \$68.00 | 0 | IN | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Recommended Items

The following items are recommended by Automationdirect for purchase with a P3-08ND3S

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|-----------------------------|---|---------------|----------|-------|---------|
| P3-RTB | REMOVABLE TERMINAL BLOCK, FOR ALL PRODUCTIVITY3000 8 & 16 POINT MODULES | \$16.00 | 0 | | |
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | 0 | NA | |
| ZL-P3-CBL20 | ZIPLINK CABLE, 20-TERM TO 24-PIN, 0.5M (1.6FT), P3000 PAC | \$31.50 | 0 | | |
| ZL-RTB20 | ZIPLINK 20-POLE FEED THROUGH MODULE | \$19.00 | 0 | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

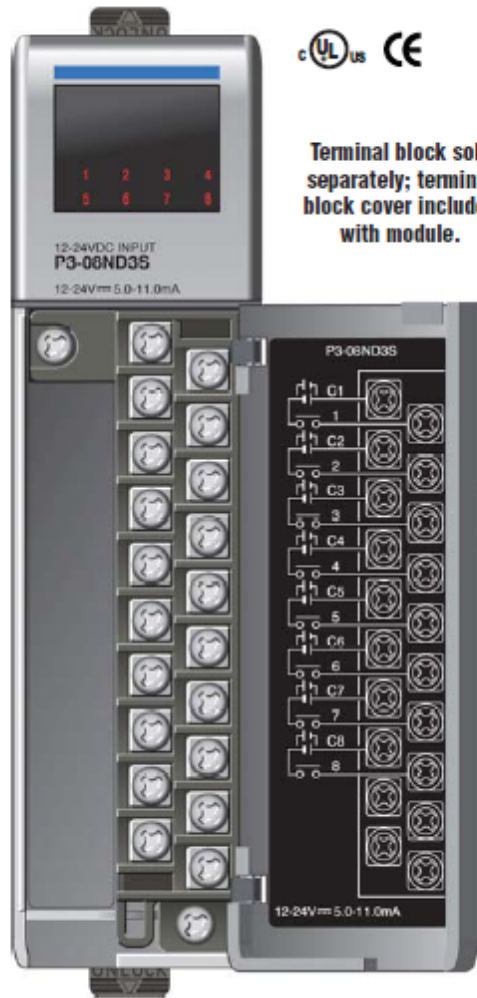
DC Input Modules

P3-08ND3S



Isolated Sinking/Sourcing Input

The P3-08ND3S DC Input Module provides eight 12-24 VDC sinking or sourcing isolated inputs.



Terminal block sold separately; terminal block cover included with module.

Input Specifications

| | | |
|-------------------------------------|--------------------------------------|-------------------|
| Inputs per Module | 8 (sinking / sourcing) | |
| Operating Voltage Range (Tolerance) | CE | 12-24 VDC (± 10%) |
| | UL | 12-24 VDC (± 10%) |
| Peak Voltage | 26.4 VDC | |
| Input Current (Typical) | 5 mA @ 12 VDC | |
| | 11 mA @ 24 VDC | |
| Maximum Input Current @ Temp | 12.5 mA @ 60° C (26.4 VDC) | |
| Input Impedance | 2.2k Ω @ 12-24 VDC | |
| ON Voltage Level | > 10 VDC | |
| OFF Voltage Level | < 3 VDC | |
| Minimum ON Current | 4 mA | |
| Maximum OFF Current | 2 mA | |
| OFF to ON Response | Max. 2 ms Typical 1ms | |
| ON to OFF Response | Max. 2 ms Typical 1ms | |
| Status Indicators | Logic Side (8 points) | |
| Terminal Type (not included) | 20-position removable terminal block | |
| Commons | 8 Isolated (1 point / common) | |

General Specifications

| | |
|-------------------------------|--|
| Operating Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Field to Logic Side Isolation | 1500 VAC applied for 1 minute |
| Insulation Resistance | >10MΩ @ 500 VDC |
| Heat Dissipation | 2.81W |
| Enclosure Type | Open Equipment |
| Agency Approvals | UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2*) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only. |
| Module Keying to Backplane | Electronic |
| Module Location | Any I/O slot in any local, expansion, or remote base in a Productivity3000 System. |
| Field Wiring | Removable terminal block (not included). Use ZIPLink wiring system or optional terminal block. See "Wiring I/O Modules". |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at www.productivitypac.com |
| Weight | 80g (2.82 oz) |

*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

We recommend using prewired ZIPLink cables and connection modules. See "Wiring Systems".

Terminal block cover included. If you wish to hand-wire your module, a removable terminal block is sold separately. Order part number [P3-RTB](#).



Removable Terminal Block Specifications

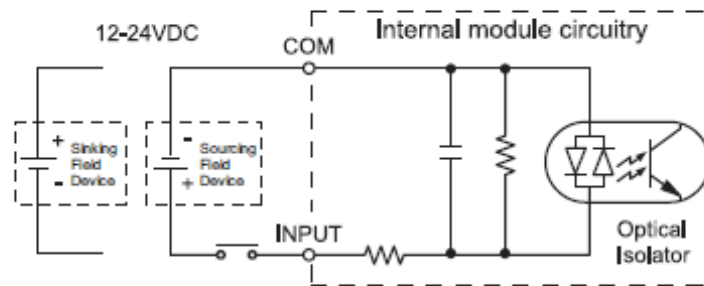
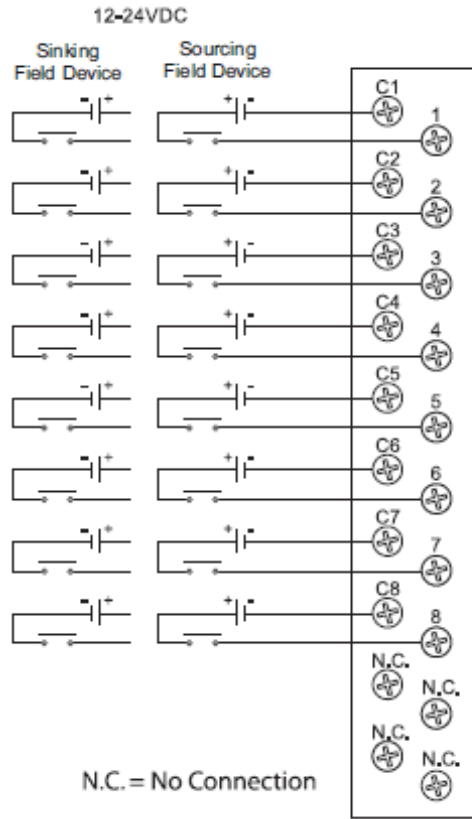
| | |
|--------------------|--|
| Description | Part No. P3-RTB ; 20 screw terminals |
| Wire Range | 22-14 AWG (0.324 to 2.08 sq. mm) Solid / stranded conductor 3/64 in. (1.2 mm) insulation maximum *USE COPPER CONDUCTORS, 60°C* or equivalent. |
| Screw Driver Width | 1/4 inch (6.5 mm) maximum |
| Screw Size | M3 size |
| Screw Torque | Field terminals – 7 - 9 in./lb (.882 - 1.02 Nm) Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm). Do not overtighten screws when installing terminal block. |

WARNING: Explosion hazard – Substitution of components may impair suitability for Class I, Division 2.

DC Input Modules

P3-08ND3S (cont'd)

Wiring Diagrams



Company Information

Systems Overview

Programmable Controllers

Field I/O

Software

CPUs & other HMI

Drives

Soft Starters

Motors & Gearbox

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temperature Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

Appendix

Product Index

Part # Index

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – ANALOG INPUT MODULES

[RELATED SECTION 25 13 00]

Model Number: P3-16AD-2

Location: Main House Mechanical Closet

Features:

Input Channels: 16

Module Signal Input Range: 0-10 VDC

Data Range: 0 to 65535

Input Type: Single-ended

Maximum Continuous Overload: +/- 100V

Filter Characteristics: Low Pass, -3dB at 100 Hz

Sample Duration Time: 7ms per Channel

All Channel Update Rate: 112ms

Conversation Method: Successive Approximation

Accuracy vs. Temperature: +/- 25 PPM/ °C Maximum

Maximum Inaccuracy: 0.1% of Range

Input Stability and Repeatability: +/- 10 LSB

Approval Certificates:

UL Safety Approval

CE

Available: Automation Direct

Price: \$442.00



AUTOMATIONDIRECT Direct sales to U.S. and Canada
Value in Automation: low prices, fast shipping, and superior service.

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 - Enclosures
 - Field I/O
 - Industrial Monitors
 - Manuals
 - Memory Devices
 - Motion Control
 - Motor Controls
 - Motors
 - Operator Interfaces
 - PC-based Control
 - Pneumatic Components
 - Power Products (Electrical)
 - Power Transmission (Mechanical)
 - Process Controls
 - Programmable Controllers
 - Pushbuttons / Switches / Indicators
 - Relays / Timers
 - Safety
 - Sensors / Encoders
 - Software Products
 - Stacklights
 - Terminal Blocks
 - Tools
 - Wiring Solutions
 - What's New
 - Inventory Reduction
 - Retired Products

You are looking at: [Programmable Controllers](#) > [Productivity3000 \(Programmable Automation Controller\)](#) > [Analog I/Q](#) > **P3-16AD-2**

Products
Reviews

P3-16AD-2

[larger image](#)

There are no reviews for this item.
Be the first to [write a review...](#)

16-channel voltage analog input module, 16-bit resolution, 0-10 VDC, external 24VDC required. Requires removable terminal block (sold separately, P3-RTB); optional ZIPLink connector modules and pre-wired cables are available.

(1) P3-RTB or a ZIPLink is required with each Productivity3000 Discrete and Analog I/O module under 32 pts.

[View product insert](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.

[Download your free Productivity3000 PAC Programming Software](#)

[Review the Productivity3000 programming online help](#)

To help select the proper ZIPLink cables and modules, view our [Productivity3000 ZIPLink Selection Chart](#).

P3-16AD-2

Documentation Links

[Specifications](#)

[Online Manual](#)

[AutoCAD Drawings](#)

[3D Model](#)

[Frequently Asked Questions](#)

[Agency Approval Checklist](#)
(CE/UL/CUL/CSA/RoHS docs)

Item Shipping Weight: 0.6 lbs.
MADE IN TAIWAN
HS Code: 8537.10

We're Hiring!

Request FREE catalog

| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|--|---------------|----------|--------------|-------|---------|
| P3-16AD-2 | 16CH, 16-BIT, VOLTAGE ANALOG INPUT, PRODUCTIVITY 3000 ANALOG INPUT MODULE I/O connector required (ZIPLink or terminal block - P3-RTB). Order separately. | \$442.00 | 0 | IN | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Recommended Items

The following items are recommended by Automationdirect for purchase with a P3-16AD-2

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|-------------------------------|---|---------------|----------|-------|---------|
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | 0 | NA | |
| ZL-P3-CBL20-L | ZIPLINK CABLE, 20-TERM TO SENSOR, 0.5M (1.6FT), P3000 PAC | \$31.50 | 0 | | |
| ZL-RTB20 | ZIPLINK 20-POLE FEED THROUGH MODULE | \$19.00 | 0 | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Analog Input Modules

P3-16AD-2



Voltage Analog Input

The P3-16AD-2 Voltage Analog Input Module provides sixteen channels for receiving 0 to 10 VDC signals.



Patent-pending LCD gives access to field signal values, as well as module and signal faults.

Terminal block sold separately; terminal block cover included with module.

Removable Terminal Block Specifications

| Description | Part No. P3-RTB; 20 screw terminals |
|--------------------|---|
| Wire Range | 22-14 AWG (0.324 to 2.08 sq. mm) Solid / stranded conductor 3/64 in. (1.2 mm) insulation maximum *USE COPPER CONDUCTORS, 60°C or equivalent. |
| Screw Driver Width | 1/4 inch (6.5 mm) maximum |
| Screw Size | M3 size |
| Screw Torque | Field terminals – 7 - 9 in./lb (.0882 - 1.02 Nm) Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm). Do not overtighten screws when installing terminal block. |

We recommend using prewired ZIPLink cables and connection modules. See "Wiring Systems".

Terminal block cover included. If you wish to hand-wire your module, a removable terminal block is sold separately. Order part number [P3-RTB](#).



Input Specifications

| | |
|---|--|
| Input Channels | 16 |
| Module Signal Input Range | 0 - 10 VDC |
| Signal Resolution | 16 bit |
| Resolution Value of LSB (least significant bit) | 0 - 10 VDC = 152 μ V per count (1 LSB = 1 count) |
| Data Range | 0 to 65535 counts |
| Input Type | Single-ended (one common) |
| Maximum Continuous Overload | \pm 100V |
| Input Impedance | 250K Ω (typical) |
| Filter Characteristics | Low Pass, -3dB @ 100Hz |
| Sample Duration Time | 7 ms per channel (does not include ladder scan time) |
| All Channel Update Rate | 112 ms |
| Open Circuit Detection Time | Zero reading within 1s |
| Conversion Method | Successive approximation |
| Accuracy vs. Temperature | \pm 25 PPM / °C Maximum |
| Maximum Inaccuracy | 0.1% of range (including temperature drift) |
| Linearity Error (end to end) | \pm 10 LSB maximum (\pm 0.015% of range) Monotonic with no missing codes |
| Input Stability and Repeatability | \pm 10 LSB |
| Full Scale Calibration Error (not including offset) | \pm 10 LSB maximum (\pm 0.015% of range) |
| Offset Calibration Error | \pm 10 LSB maximum |
| Max Crosstalk | -76 dB, 10 LSB |
| External DC Power Required | 24 VDC (-20% / + 25%), 41mA maximum |

General Specifications

| | |
|-------------------------------|--|
| Operating Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Field to Logic Side Isolation | 1800 VAC applied for 1 second |
| Insulation Resistance | >10M Ω @ 500 VDC |
| Heat Dissipation | 1.4 W |
| Enclosure Type | Open Equipment |
| Agency Approvals | UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2*) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only. |
| Module Keying to Backplane | Electronic |
| Module Location | Any I/O slot in any local, expansion, or remote base in a Productivity3000 System. |
| Field Wiring | Removable terminal block (not included). Use ZIPLink wiring system or optional terminal block. See "Wiring I/O Modules". |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at www.productivitypac.com |
| Terminal Type (not included) | 20-position removable terminal block |
| Weight | 105g (3.73 oz) |

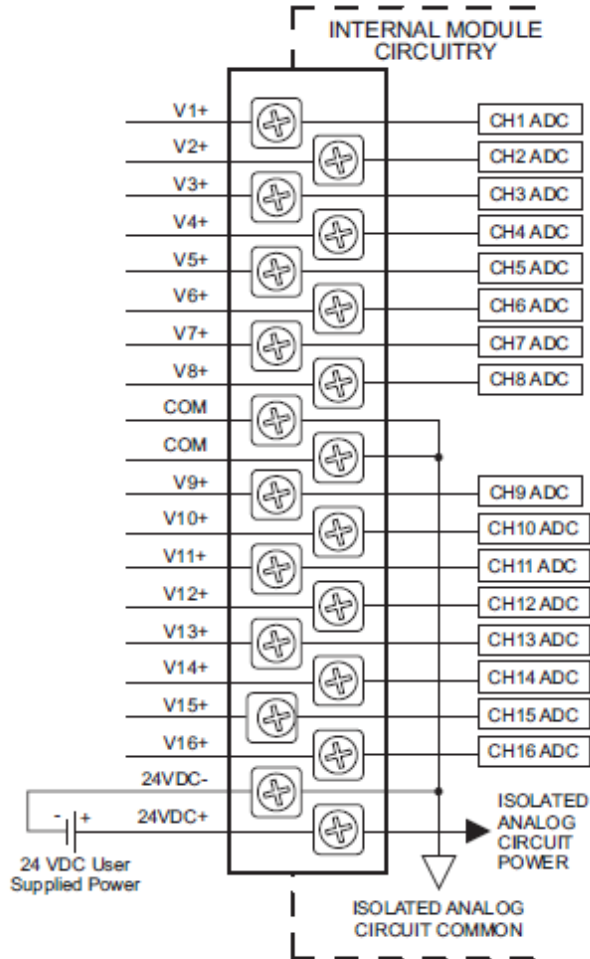
*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

WARNING: Explosion hazard – Substitution of components may impair suitability for Class I, Division 2.

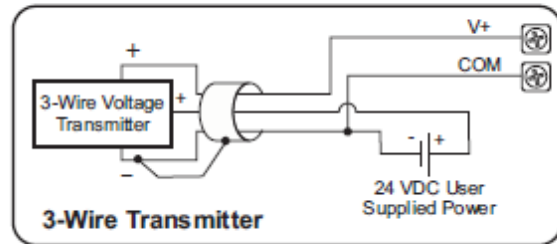
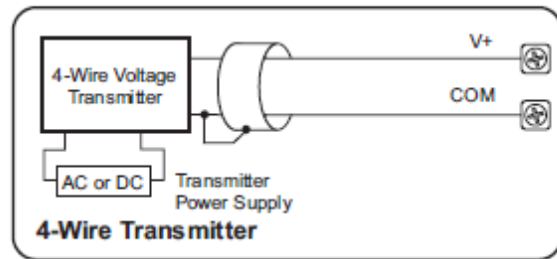
Analog Input Modules

P3-16AD-2 (cont'd)

Wiring Diagrams



Voltage Input Circuits





Specify your ZIPLink system

Use the Compatibility Matrix table below.

| | |
|---------------|---|
| Step 1 | Locate the I/O module part number. |
| Step 2 | Locate Connector Module Type. (Feedthrough Module, Fuse Module, etc...) |
| Step 3 | Select the cable length by replacing the # symbol with: Blank = 0.5m, -1 = 1.0m, -2 = 2.0m ¹ |

¹Note: Cable part number denotes compatibility between Connector Module and I/O Modules.

| Productivity3000 ZIPLink Wiring System Compatibility Matrix | | | | | | | | |
|---|---------------------|----------------------|------------------|----------------------|------------------|---------------------|---------------------|-----------------------|
| Step 2: Connector Module Type | | Feedthrough Modules | | Fuse Modules | | Relay Module | Sensor Input Mod. | Pigtail Cable |
| Step 1: I/O Module | Number of Terminals | ZL-RTB20 | ZL-RTB40 | ZL-RFU20 | ZL-RFU40 | ZL-RR16-24 | ZL-LTB16-24 | |
| | | Step 3: Cables | | | | | | |
| Inputs | | | | | | | | |
| <u>P3-08NAS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08ND3S</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16NA</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16ND3</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-32ND3</u> | 40 | | <u>ZL-CBL40#</u> | | | | <u>ZL-P3-CBL40#</u> | |
| <u>P3-64ND3*</u> | 40 | | <u>ZL-CBL40#</u> | | | | <u>ZL-P3-CBL40#</u> | |
| Outputs | | | | | | | | |
| <u>P3-08TAS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TD1S</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TD2S</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TRS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TA</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20L#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TD1</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TD2</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TR</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TRS-1***</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-32TD1</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-32TD2</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-64TD1*</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-64TD2*</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| Analog In | | | | | | | | |
| <u>P3-04ADS</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08AD</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16AD-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16AD-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08RTD**</u> | Matched Only | | | | | | | |
| <u>P3-08THM**</u> | T/C Wire Only | | | | | | | |
| Analog Out | | | | | | | | |
| <u>P3-04DA</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-06DAS-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-06DAS-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| Analog Combo | | | | | | | | |
| <u>P3-8AD4DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-8AD4DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |

*The P3-64ND3, P3-64TD1, and P3-64TD2 modules have two 32-point connectors and require 2 ZIPLink cables and 2 ZIPLink connector modules.

**These modules are not supported by the ZIPLink wiring system. Removable terminal block P3-RTB included.

***The P3-08TRS-1 output module is derated, not to exceed 2A per point maximum when used with the ZIPLink wiring system.

I/O Modules

A variety of discrete and analog I/O modules are available for use in local, expansion, and remote I/O bases. Specifications for each module are on the following pages.

A filler module is available for unused I/O module slots (part number [P3-FILL](#)).



Discrete Output Modules

| Productivity3000 Discrete Output Modules | | | |
|--|-------------------|--------------------------|-------|
| Part Number | Number of Outputs | Description | Price |
| P3-08TD1S | 8 | Isolated Sinking Output | ↔ |
| P3-08TD2S | 8 | Isolated Sourcing Output | ↔ |
| P3-16TD1 | 16 | Sinking Output | ↔ |
| P3-16TD2 | 16 | Sourcing Output | ↔ |
| P3-32TD1* | 32 | Sinking Output | ↔ |
| P3-32TD2* | 32 | Sourcing Output | ↔ |
| P3-64TD1* | 64 | Sinking Output | ↔ |
| P3-64TD2* | 64 | Sourcing Output | ↔ |
| P3-08TAS | 8 | Isolated AC Output | ↔ |
| P3-16TA | 16 | AC Output | ↔ |
| P3-08TRS | 8 | Isolated Relay Output | ↔ |
| P3-16TR | 16 | Relay Output | ↔ |
| P3-08TRS-1 | 8 | Isolated Relay Output | ↔ |

*ZIPLink required.

Discrete Input Modules

| Productivity3000 Discrete Input Modules | | | |
|---|------------------|------------------------------------|-------|
| Part Number | Number of Inputs | Description | Price |
| P3-16SIM | 16 | Input Simulator Module | ↔ |
| P3-08ND3S | 8 | Isolated Sinking/Sourcing DC Input | ↔ |
| P3-16ND3 | 16 | Sinking/Sourcing DC Input | ↔ |
| P3-32ND3* | 32 | Sinking/Sourcing DC Input | ↔ |
| P3-64ND3* | 64 | Sinking/Sourcing DC Input | ↔ |
| P3-08NAS | 8 | Isolated AC Input | ↔ |
| P3-16NA | 16 | AC Input | ↔ |

*ZIPLink required.

Analog I/O Modules

| Productivity3000 Analog Input Modules | | | |
|---------------------------------------|--------------------|---------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-04ADS | 4 | Isolated Analog Input | ↔ |
| P3-08AD | 8 | Analog Input | ↔ |
| P3-16AD-1 | 16 | Analog Input (Current) | ↔ |
| P3-16AD-2 | 16 | Analog Input (Voltage) | ↔ |
| P3-08RTD | 8 | Analog RTD Input | ↔ |
| P3-08THM | 8 | Analog Thermocouple Input | ↔ |

| Productivity3000 Analog Output Modules | | | |
|--|--------------------|----------------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-04DA | 4 | Analog Output | ↔ |
| P3-08DA-1 | 8 | Analog Output (Current) | ↔ |
| P3-08DA-2 | 8 | Analog Output (Voltage) | ↔ |
| P3-06DAS-1 | 6 | Isolated Analog Output (Current) | ↔ |
| P3-06DAS-2 | 6 | Isolated Analog Output (Voltage) | ↔ |
| P3-16DA-1 | 16 | Analog Output (Current) | ↔ |
| P3-16DA-2 | 16 | Analog Output (Voltage) | ↔ |

| Productivity3000 Analog Input/Output Modules | | | |
|--|--------------------|-------------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-8AD4DA-1 | 8/4 | Analog Input/Output (Current) | ↔ |
| P3-8AD4DA-2 | 8/4 | Analog Input/Output (Voltage) | ↔ |

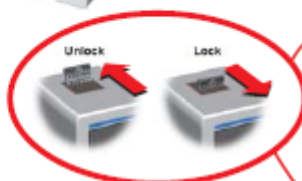
Module Installation Procedure



WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

Step One: Align circuit card with slot and press firmly to seat module into connector.

Step Two: Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.



Step Three: Attach field wiring using optional terminal block or ZIPLink wiring system and install cover.



To install or remove terminal block cover, press middle to flex cover.



WARNING: Explosion hazard – Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous. Do not hot-swap modules unless the area is known to be non-hazardous.

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – ANALOG OUTPUT MODULES

[RELATED SECTION 25 13 00]

Model Number: P3-16DA-2

Location: Main House Mechanical Closet

Features:

Output Channels: 16

Module Signal Output Range: +/- 10VDC

Output Signal Resolution: 16-Bit

Data Range: -32768 to +32767

Output Type: Voltage [10mA max Current]

Allowed Load Type: Grounded

Accuracy vs. Temperature: +/- 25 PPM/ °C Maximum

Maximum Inaccuracy: 0.1% of Range

Maximum Offset Calibration Error: +/- 0.025% of Range Maximum

Output Stability and Repeatability: +/- 10 LSB after 10 minute Warm Up

Approval Certificates:

UL Safety Approval

CE

Available: Automation Direct

Price: \$776.00



AUTOMATIONDIRECT Direct sales to U.S. and Canada
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You are looking at: [Programmable Controllers](#) > [Productivity3000 \(Programmable Automation Controller\)](#) > [Analog I/O](#) > **P3-16DA-2**

Products

Reviews

P3-16DA-2


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16-channel voltage analog output module, 16-bit resolution, +/-10 VDC, external 24VDC required. Requires removable terminal block (sold separately, P3-RTB); optional ZIPLink connector modules and pre-wired cables are available.

(1) P3-RTB or a ZIPLink is required with each Productivity3000 Discrete and Analog I/O module under 32 pts.

[View product insert](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.

[Download your free Productivity3000 PAC Programming Software](#)

Review the [Productivity3000 programming online help](#)


To help select the proper ZipLink cables and modules, view our [Productivity3000 ZipLink Selection Chart](#)

P3-16DA-2

Documentation Links

- [Specifications](#)
- [Online Manual](#)
- [AutoCAD Drawings](#)
- [3D Model](#)
- [Frequently Asked Questions](#)
- [Agency Approval Checklist](#)
(CE/UL/CUL/CSA/RoHS docs)

Item Shipping Weight: 0.7 lbs.
MADE IN TAIWAN
HS Code: 8537.10



| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|--|---------------|----------|--------------|-------|---------|
| P3-16DA-2 | 16CH, 16-BIT, VOLTAGE ANALOG OUTPUT, PRODUCTIVITY 3000 ANALOG OUTPUT MODULE I/O connector required (ZipLink or terminal block - P3-RTB). Order separately. | \$776.00 | 0 | IN | PDF | PDF |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.


Recommended Items

The following items are recommended by Automationdirect for purchase with a P3-16DA-2

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|-------------------------------|---|---------------|----------|-------|---------|
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | 0 | NA | PDF |
| ZL-P3-CBL20-L | ZIPLINK CABLE, 20-TERM TO SENSOR, 0.5M (1.6FT), P3000 PAC | \$31.50 | 0 | PDF | PDF |
| ZL-RTB20 | ZIPLINK 20-POLE FEED THROUGH MODULE | \$19.00 | 0 | PDF | PDF |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

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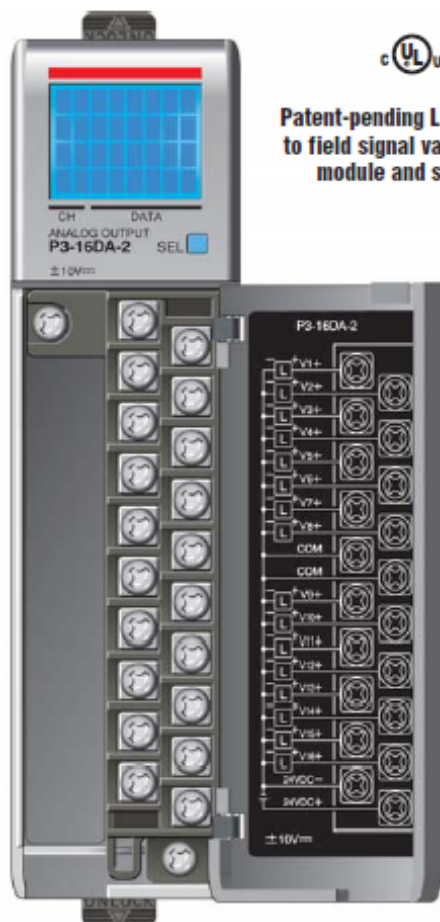
Analog Output Modules

P3-16DA-2



Voltage Analog Output

The P3-16DA-2 Voltage Analog Output Module provides sixteen channels of ± 10 VDC outputs.



Patent-pending LCD gives access to field signal values, as well as module and signal faults.

Terminal block sold separately; terminal block cover included with module.

Output Specifications

| | |
|---|---|
| Output Channels | 16 |
| Module Signal Output Range | ± 10 VDC |
| Output Signal Resolution | 16-bit |
| Resolution Value of LSB (least significant bit) | ± 10 V = 305 μ V/count 1 LSB = 1 count |
| Data Range | -32768 to +32767 |
| Output type (sourcing/sinking) | Voltage (10mA max current) |
| Output Value in Fault Mode | 0V |
| Output Impedance | 0.2 Ω typical |
| Load Impedance | $\geq 1000\Omega$ |
| Maximum Capacitive Load | .01 μ F maximum |
| Allowed Load Type | Grounded |
| Maximum Inaccuracy | 0.1% of range (including temperature drift) |
| Maximum Full Scale Calibration Error (not including offset error) | $\pm 0.025\%$ of range maximum |
| Maximum Offset Calibration Error | $\pm 0.025\%$ of range maximum |
| Accuracy vs. Temperature | ± 25 ppm/ $^{\circ}$ C maximum f.s. calibration change ($\pm .0025\%$ of range / $^{\circ}$ C) |
| Max Crosstalk | -96 dB, 1 LSB |
| Linearity Error (end to end) | ± 16 LSB maximum ($\pm 0.025\%$ of full scale) Monotonic with no missing codes |
| Output Stability and Repeatability | ± 10 LSB after 10 min. warm-up (typical) |
| Output Ripple | 0.05% of full scale |
| Output Settling Time | 0.3 ms max, 5 μ s min (full scale change) |
| All Channel Update Rate | 0.6 ms |
| Maximum Continuous Overload | Outputs current limited to 40mA typical Continuous overloads on multiple outputs can damage the module. |
| Type of Output Protection | 0.1 μ F Transient Suppressor |
| External DC Power Required | 24 VDC (-20% / + 25%), 252mA |

General Specifications

| | |
|-------------------------------|--|
| Operating Temperature | 0 $^{\circ}$ to 60 $^{\circ}$ C (32 $^{\circ}$ to 140 $^{\circ}$ F) |
| Storage Temperature | -20 $^{\circ}$ to 70 $^{\circ}$ C (-4 $^{\circ}$ to 158 $^{\circ}$ F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Field to Logic Side Isolation | 1800VAC applied for 1 second |
| Insulation Resistance | >10M Ω @ 500 VDC |
| Heat Dissipation | 6.4 W |
| Enclosure Type | Open Equipment |
| Agency Approvals | UL508 and UL1604 (Certified for Canada and USA) CE (EN61131-2*) This equipment is suitable for use in Class I, Division 2/Zone 2, Groups A, B, C, and D or non-hazardous locations only. |
| Module Keying to Backplane | Electronic |
| Module Location | Any I/O slot in any local, expansion, or remote base in a Productivity3000 System. |
| Field Wiring | Removable terminal block (not included). Use ZIPLink wiring system or optional terminal block. See "Wiring I/O Modules". |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at: www.productivitypac.com |
| Terminal Type (not included) | 20-position removable terminal block |
| Weight | 105g (3.73 oz) |

*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

WARNING: Explosion hazard – Substitution of components may impair suitability for Class I, Division 2.

Removable Terminal Block Specifications

| | |
|--------------------|---|
| Description | Part No. P3-RTB; 20 screw terminals |
| Wire Range | 22-14 AWG (0.324 to 2.08 sq. mm) Solid / stranded conductor 3/64 in. (1.2 mm) insulation maximum *USE COPPER CONDUCTORS, 60 $^{\circ}$ C or equivalent. |
| Screw Driver Width | 1/4 inch (6.5 mm) maximum |
| Screw Size | M3 size |
| Screw Torque | Field terminals – 7 - 9 in./lb (.0882 - 1.02 Nm) Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm). Do not overtighten screws when installing terminal block. |

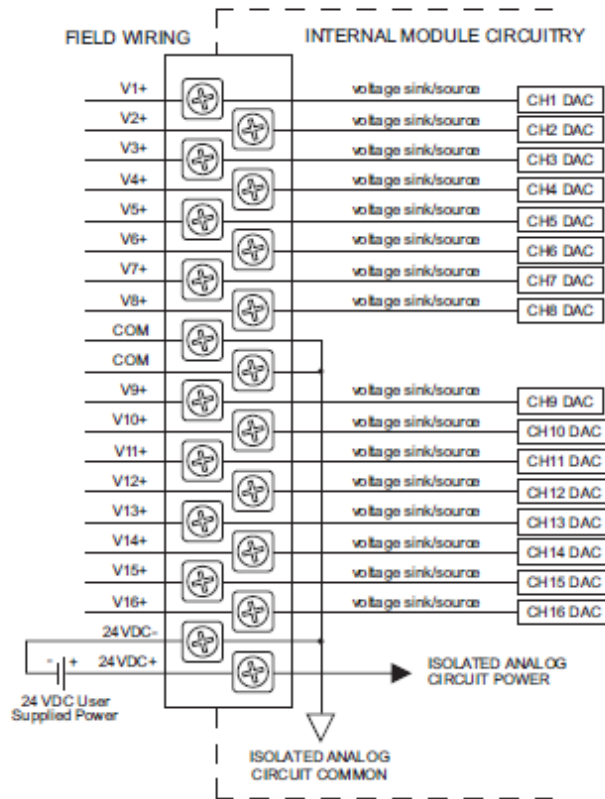
We recommend using prewired ZIPLink cables and connection modules. See "Wiring Systems".

Terminal block cover included. If you wish to hand-wire your module, a removable terminal block is sold separately. Order part number P3-RTB.

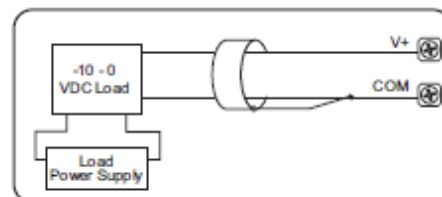
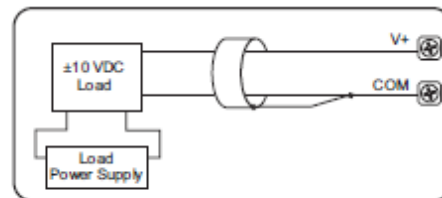
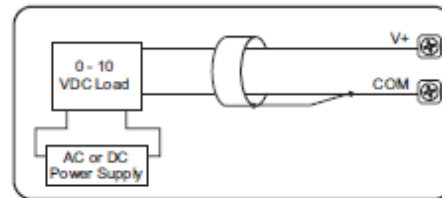


Analog Output Modules

P3-16DA-2 (cont'd)



Voltage Output Circuits



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Appendix

Product Index

Part # Index

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – RELAY OUTPUT

[RELATED SECTION 25 13 00]

Model Number: P3-16TR

Location: Main House Mechanical Closet

Weight: 5.64 oz [160 g]

Features:

Output Channels: 16

Operating Voltage Range: 6.25-24 VDC [\pm 20%]

Output Type: Relay, form A [SPST]

Approval Certificates:

UL Safety Approval (UL508 file E157382 and UL1604 file E200031)

CE: EN61121-2

Meets EMC and Safety requirements

Available: Automation Direct

Price: \$130.00



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P3-16TR

16-point, 6-27 VDC, 6-240 VAC relay output module, 1.25A / point, 6.3A / common @ 60 deg. C, 2 commons (isolated), 8 points / common, with Form A (SPST) relays. Requires removable terminal block (sold separately, P3-RTB); optional ZIPLink connector modules and pre-wired cables are available. 6.3A user replaceable fuse / common (replacement fuse P3-FUSE-2).

(1) P3-RTB or a ZIPLink is required with each Productivity3000 Discrete and Analog I/O module under 32 pts.

[View product insert](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site site at no charge. Free programming package available via download from the web.

[Download your free Productivity3000 PAC Programming Software](#)

[Review the Productivity3000 programming online help.](#)

To help select the proper ZIPLink cables and modules, view our [Productivity3000 ZIPLink Selection Chart](#).

P3-16TR

Documentation Links

[Specifications](#)

[Online Manual](#)

[AutoCAD Drawings](#)

[3D Model](#)

[Frequently Asked Questions](#)

[Agency Approval Checklist](#)
(CE/UL/CUL/CSA/RoHS docs)

Item Shipping Weight: 0.5 lbs.
MADE IN JAPAN
HS Code: 8537.10

2 YEAR WARRANTY

There are no reviews for this item.
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| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|-----------|--|---------------|----------|--------------|-------|---------|
| P3-16TR | 16PT OUTPUT RELAY (16 FORM A), PRODUCTIVITY3000 RELAY OUTPUT MODULE I/O connector required (ZIPLink or terminal block - P3-RTB). Order separately. | \$130.00 | 0 | IN | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Recommended Items

The following items are recommended by Automationsdirect for purchase with a P3-16TR

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|-----------------------------|---|---------------|----------|-------|---------|
| P3-RTB | REMOVABLE TERMINAL BLOCK, FOR ALL PRODUCTIVITY3000 8 & 16 POINT MODULES | \$16.00 | 0 | | |
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | 0 | NA | |
| ZL-P3-CBL20 | ZIPLINK CABLE, 20-TERM TO 24-PIN, 0.5M (1.6FT), P3000 PAC | \$31.50 | 0 | | |
| ZL-RTB20 | ZIPLINK 20-POLE FEED THROUGH MODULE | \$19.00 | 0 | | |
| ZL-RFU20 | ZIPLINK 16-POINT FUSE MODULE | \$64.50 | 0 | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Relay Output Modules

P3-16TR



Relay Output

The P3-16TR Relay Output Module provides sixteen 1.25A relay outputs with two isolated fused commons.



Terminal block sold separately; terminal block cover included with module.

Typical Relay Life

| Voltage & Type of Load | Load Current 1.25A |
|------------------------|--------------------|
| 30VDC Resistive | 240K |
| 30VDC Solenoid | 110K |
| 120VAC Resistive | 320K |
| 120VAC Solenoid | 210K |
| 240VAC Resistive | 240K |
| 240VAC Solenoid | 140K |

We recommend using prewired ZIPLink cables and connection modules. See "Wiring Systems".

Terminal block cover included. If you wish to hand-wire your module, a removable terminal block is sold separately. Order part number [P3-RTB](#).



Output Specifications

| | |
|-------------------------------------|--|
| Outputs per Module | 16 |
| Operating Voltage Range (Tolerance) | (CE) 6.25 - 24 VDC (-15% / + 20%) 6 - 240 VAC (-15% / + 10%) |
| | (UL) 6 - 27 VDC (-15% / + 10%) 6 - 240 VAC (-10% / + 10%) |
| Output type | Relay, form A (SPST) |
| AC Frequency | 47 - 63 Hz |
| Maximum Output Current @ Temp | 1.25A / point, 6.3A / common @ 60°C for both AC and DC |
| Minimum Load Current | 5 mA @ 5 VDC |
| Maximum Inrush Current | 4A for 10 ms |
| OFF to ON Response | ≤ 10 ms |
| ON to OFF Response | ≤ 10 ms |
| Status Indicators | Logic Side (16 points) |
| Error Status Indicator | Blown Fuse (one for each common) |
| Terminal Type (not included) | 20-position removable terminal block |
| Commons per module | 2 Isolated (8 point / common) |
| Fuses | 6.3A user replaceable fuse per common For replacement, order P3-FUSE-2 . (Qty. 5/pkg.) |

General Specifications

| | |
|-------------------------------|--|
| Operating Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Field to Logic Side Isolation | 1500VAC applied for 1 minute |
| Insulation Resistance | >10MΩ @ 500 VDC |
| Heat Dissipation | 3.93W |
| Enclosure Type | Open Equipment |
| Agency Approvals | UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2*) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only. |
| Module Keying to Backplane | Electronic |
| Module Location | Any I/O slot in any local, expansion, or remote base in a Productivity3000 System. |
| Field Wiring | Removable terminal block (not included). Use ZIPLink wiring system or optional terminal block. See "Wiring I/O Modules". |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at: www.productivitypac.com |
| Weight | 160g (5.64 oz) |

*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

WARNING: Explosion hazard – Substitution of components may impair suitability for Class 1, Division 2.

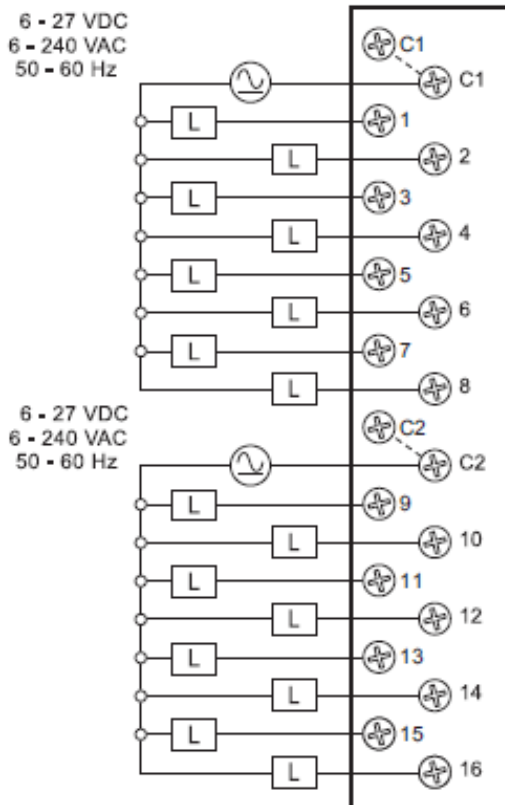
Removable Terminal Block Specifications

| | |
|--------------------|---|
| Description | Part No. P3-RTB ; 20 screw terminals |
| Wire Range | 22-14 AWG (0.324 to 2.08 sq. mm) Solid / stranded conductor 3/64 in. (1.2 mm) insulation maximum *USE COPPER CONDUCTORS, 60°C or equivalent. |
| Screw Driver Width | 1/4 inch (6.5 mm) maximum |
| Screw Size | M3 size |
| Screw Torque | Field terminals – 7 - 9 in./lb (.0882 - 1.02 Nm) Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm). Do not overtighten screws when installing terminal block. |

Relay Output Modules

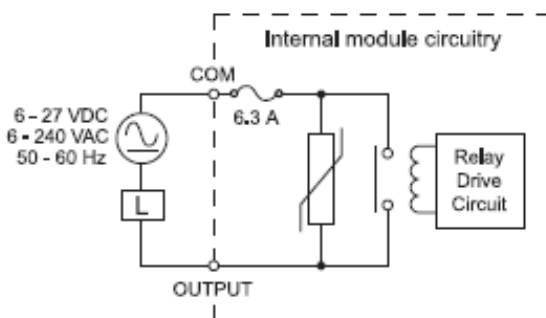
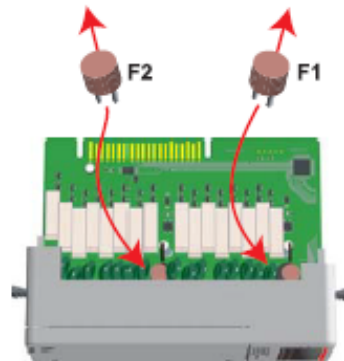
P3-16TR (cont'd)

Wiring Diagrams



Replaceable Fuses

Order Part Number [P3-FUSE-2](#).
(Qty. 5 per pkg.) One spare included with this module.





Specify your ZIPLink system

Use the Compatibility Matrix table below.

| | |
|--|---|
| Step 1 | Locate the I/O module part number. |
| Step 2 | Locate Connector Module Type. (Feedthrough Module, Fuse Module, etc...) |
| Step 3 | Select the cable length by replacing the # symbol with: Blank = 0.5m, -1 = 1.0m, -2 = 2.0m ¹ |
| ¹ Note: Cable part number denotes compatibility between Connector Module and I/O Modules. | |

| Productivity3000 ZIPLink Wiring System Compatibility Matrix | | | | | | | | |
|---|---------------------|----------------------|------------------|----------------------|------------------|---------------------|---------------------|-----------------------|
| Step 2: Connector Module Type | | Feedthrough Modules | | Fuse Modules | | Relay Module | Sensor Input Mod. | Pigtail Cable |
| Step 1: I/O Module | Number of Terminals | ZL-RTB20 | ZL-RTB40 | ZL-RFU20 | ZL-RFU40 | ZL-RRL16-24 | ZL-LTB16-24 | |
| | | Step 3: Cables | | | | | | |
| Inputs | | | | | | | | |
| <u>P3-08NAS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08ND3S</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16NA</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16ND3</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-32ND3</u> | 40 | | <u>ZL-CBL40#</u> | | | | <u>ZL-P3-CBL40#</u> | |
| <u>P3-64ND3*</u> | 40 | | <u>ZL-CBL40#</u> | | | | <u>ZL-P3-CBL40#</u> | |
| Outputs | | | | | | | | |
| <u>P3-08TAS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TD1S</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TD2S</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TRS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TA</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20L#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TD1</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TD2</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TR</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TRS-1***</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-32TD1</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-32TD2</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-64TD1*</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-64TD2*</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| Analog In | | | | | | | | |
| <u>P3-04ADS</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08AD</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16AD-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16AD-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08RTD**</u> | Matched Only | | | | | | | |
| <u>P3-08THM**</u> | T/C Wire Only | | | | | | | |
| Analog Out | | | | | | | | |
| <u>P3-04DA</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-06DAS-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-06DAS-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| Analog Combo | | | | | | | | |
| <u>P3-8AD4DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-8AD4DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |

¹The P3-64ND3, P3-64TD1, and P3-64TD2 modules have two 32-point connectors and require 2 ZIPLink cables and 2 ZIPLink connector modules.

**These modules are not supported by the ZIPLink wiring system. Removable terminal block P3-RTB Included.

***The P3-08TRS-1 output module is derated, not to exceed 2A per point maximum when used with the ZIPLink wiring system.

I/O Modules

A variety of discrete and analog I/O modules are available for use in local, expansion, and remote I/O bases. Specifications for each module are on the following pages.

A filler module is available for unused I/O module slots (part number [P3-FILL](#)).



Discrete Input Modules

| Productivity3000 Discrete Input Modules | | | |
|---|------------------|------------------------------------|-------|
| Part Number | Number of Inputs | Description | Price |
| P3-16SIM | 16 | Input Simulator Module | ↔ |
| P3-08ND3S | 8 | Isolated Sinking/Sourcing DC Input | ↔ |
| P3-16ND3 | 16 | Sinking/Sourcing DC Input | ↔ |
| P3-32ND3* | 32 | Sinking/Sourcing DC Input | ↔ |
| P3-64ND3* | 64 | Sinking/Sourcing DC Input | ↔ |
| P3-08NAS | 8 | Isolated AC Input | ↔ |
| P3-16NA | 16 | AC Input | ↔ |

*ZIPLink required.

Analog I/O Modules

| Productivity3000 Analog Input Modules | | | |
|---------------------------------------|--------------------|---------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-04ADS | 4 | Isolated Analog Input | ↔ |
| P3-08AD | 8 | Analog Input | ↔ |
| P3-16AD-1 | 16 | Analog Input (Current) | ↔ |
| P3-16AD-2 | 16 | Analog Input (Voltage) | ↔ |
| P3-08RTD | 8 | Analog RTD Input | ↔ |
| P3-08THM | 8 | Analog Thermocouple Input | ↔ |

| Productivity3000 Analog Output Modules | | | |
|--|--------------------|----------------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-04DA | 4 | Analog Output | ↔ |
| P3-08DA-1 | 8 | Analog Output (Current) | ↔ |
| P3-08DA-2 | 8 | Analog Output (Voltage) | ↔ |
| P3-06DAS-1 | 6 | Isolated Analog Output (Current) | ↔ |
| P3-06DAS-2 | 6 | Isolated Analog Output (Voltage) | ↔ |
| P3-16DA-1 | 16 | Analog Output (Current) | ↔ |
| P3-16DA-2 | 16 | Analog Output (Voltage) | ↔ |

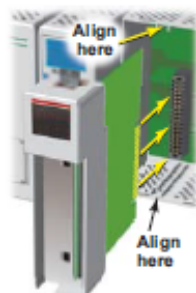
| Productivity3000 Analog Input/Output Modules | | | |
|--|--------------------|-------------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-8AD4DA-1 | 8/4 | Analog Input/Output (Current) | ↔ |
| P3-8AD4DA-2 | 8/4 | Analog Input/Output (Voltage) | ↔ |

Discrete Output Modules

| Productivity3000 Discrete Output Modules | | | |
|--|-------------------|--------------------------|-------|
| Part Number | Number of Outputs | Description | Price |
| P3-08TD1S | 8 | Isolated Sinking Output | ↔ |
| P3-08TD2S | 8 | Isolated Sourcing Output | ↔ |
| P3-16TD1 | 16 | Sinking Output | ↔ |
| P3-16TD2 | 16 | Sourcing Output | ↔ |
| P3-32TD1* | 32 | Sinking Output | ↔ |
| P3-32TD2* | 32 | Sourcing Output | ↔ |
| P3-64TD1* | 64 | Sinking Output | ↔ |
| P3-64TD2* | 64 | Sourcing Output | ↔ |
| P3-08TAS | 8 | Isolated AC Output | ↔ |
| P3-16TA | 16 | AC Output | ↔ |
| P3-08TRS | 8 | Isolated Relay Output | ↔ |
| P3-16TR | 16 | Relay Output | ↔ |
| P3-08TRS-1 | 8 | Isolated Relay Output | ↔ |

*ZIPLink required.

Module Installation Procedure



WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

Step One: Align circuit card with slot and press firmly to seat module into connector.

Step Two: Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.



Step Three: Attach field wiring using optional terminal block or ZIPLink wiring system and install cover.



To install or remove terminal block cover, press middle to flex cover.



WARNING: Explosion hazard – Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous. Do not hot-swap modules unless the area is known to be non-hazardous.

AUTOMATION DIRECT PROGRAMMABLE LOGIC CONTROLLER – RELAY OUTPUT MODULES

[RELATED SECTION 25 13 00]

Model Number: P3-08TRS-1

Location: Main House Mechanical Closet

Weight: 10.08 oz [286 g]

Features:

Output per Module: 8 relays [non-latching]

Operating Voltage Range: 6.25-24 VDC [-15% / +20%]

Output Type: 4 form C [SPST-NO/NC], 4 form A [SPST-NO]

Approval Certificates:

UL Safety Approval (UL508 file E157382 and UL1604 file E200031)

CE: EN61121-2

Meets EMC and Safety requirements

Available: Automation Direct



- Product Lines**
- Cables
 - Circuit Protection / Fuses / Disconnects
 - Communications
 - Drives
 - Enclosures
 - Field I/O
 - Industrial Monitors
 - Manuals
 - Memory Devices
 - Motion Control
 - Motor Controls
 - Motors
 - Operator Interfaces
 - PC-based Control
 - Pneumatic Components
 - Power Products (Electrical)
 - Power Transmission (Mechanical)
 - Process Controls
 - Programmable Controllers
 - Pushbuttons / Switches / Indicators
 - Relays / Timers
 - Safety
 - Sensors / Encoders
 - Software Products
 - Stacklights
 - Terminal Blocks
 - Tools
 - Wiring Solutions
 - What's New
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We're Hiring!



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You are looking at: [Programmable Controllers](#) > [Productivity3000 \(Pr...](#) > [AC I/O \(Relay Outputs\)](#) > **P3-08TRS-1**

P3-08TRS-1



[larger image](#)

There are no reviews for this item. Be the first to [write a review...](#)

8-point, 5-30 VDC / 5-240 VAC isolated relay output module, 6.3A / point @ 23 deg. C, 5.0A / point @ 60 deg. C, 8 commons (isolated), 1 point / common, with 4 Form C relays and 4 Form A relays. Requires removable terminal block (sold separately, P3-RTB); optional ZIPLink connector modules and pre-wired cables are available. 6.3A user replaceable fuse / common (replacement fuse P3-FUSE-2).

(1) P3-RTB or a ZIPLink is required with each Productivity3000 Discrete and Analog I/O module under 32 pts.

[View product insert](#)

Manuals do not come with our products unless specified in the description. Download manual from our web site at no charge. Free programming package available via download from the web.

[Download your free Productivity3000 PAC Programming Software](#)

[Review the Productivity3000 programming online help.](#)

To help select the proper Ziplink cables and modules, view our [Productivity3000 Ziplink Selection Chart](#)

P3-08TRS-1

Documentation Links

[Specifications](#)

[Online Manual](#)


[AutoCAD Drawings](#)

[3D Model](#)

Frequently Asked Questions

[Agency Approval Checklist](#)
(CE/UL/CUL/CSA/RoHS docs)

Item Shipping Weight: 0.9 lbs.
MADE IN TAIWAN
HS Code: 8537.10



| Item Code | Short Description | Price (US \$) | Quantity | Stock Status | Specs | Fav/BOM |
|------------|---|---------------|----------|--------------|-------|---------|
| P3-08TRS-1 | 8CH, ISOLATED, 5A RELAY, OUTPUT MODULE PRODUCTIVITY 3000 RELAY OUTPUT MODULE I/O connector required (Ziplink or terminal block - P3-RTB). Order separately. | \$106.00 | 0 | IN | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Recommended Items
The following items are recommended by Automationdirect for purchase with a P3-08TRS-1

| Item Code | Short Description | Price (US \$) | Quantity | Specs | Fav/BOM |
|-------------------------------|---|---------------|----------|-------|---------|
| P3-USER-M | PRODUCTIVITY3000 HARDWARE USERS MANUAL | \$29.00 | 0 | NA | |
| ZL-P3-CBL20-L | ZIPLINK CABLE, 20-TERM TO SENSOR, 0.5M (1.6FT), P3000 PAC | \$31.50 | 0 | | |
| ZL-RTB20 | ZIPLINK 20-POLE FEED THROUGH MODULE | \$19.00 | 0 | | |

For each item, enter the quantity you wish to order and press Update. Items can be added to your favorites list or a bill of materials by clicking on the icon in the right hand column.

Price: \$106.00

Relay Output Modules

P3-08TRS-1



Isolated Relay Output

The P3-08TRS-1 High-Current Isolated Relay Output Module provides eight 5A relay outputs with eight fused commons.



Terminal block sold separately; terminal block cover included with module.

Output Specifications

| | |
|--|---|
| Outputs per Module | 8 relays (non-latching) |
| Commons per Module | 8 (isolated) |
| Operating Voltage Range (Tolerance) | (CE) 6.25-24 VDC (-15% / +20%) 6-240 VAC (-15% / +10%) |
| | (UL) 5-30 VDC (-0% / +10%) 5-240 VAC (-0% / +10%) |
| Output Type | 4 Form C (SPDT-NO/NC), 4 Form A (SPST-NO) |
| AC Frequency | 47-63 Hz |
| On Voltage Drop | Minimal (90 mV max for fuse at 10A) |
| Max Output Current @ Temperature (Resistive)* | 6.3A at 23°C, 5.0A at 60°C For both AC and DC |
| Maximum Leakage Current | Minimal (5 µA for TVS diode) |
| Minimum Load | 10 mA @ 5 VDC |
| Maximum Inrush Current | 12A |
| External DC Required | None |
| OFF to ON Response | 10 ms |
| ON to OFF Response | 5 ms (Excluding NO bounce) |
| Terminal Type (not included) | 20-position removable terminal block |
| Status Indicators | Logic side |
| Fuses | 6.3A user replaceable fuse per common For replacement, order P3-FUSE-2 (5/Pkg.) |
| Dielectric Strength (Between normally open and normally closed contacts on the same relay) | 1500 VAC @ 1 min logic to output and isolated output to output, 750 VAC @ 1 min between contacts on same relay (Same as 1800 VAC @ 1 sec and 900 VAC @ 1 sec) |
| Transient Voltage Suppression (Bi-directional TVS diode) | 482V clamp @ 1.25A peak pulse current |
| Mechanical Life Expectancy | >100,000 at 30 operations per minute |

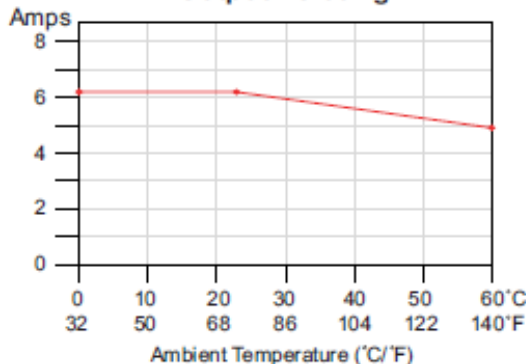
*Rating is for a normally-open contact. Normally-closed contacts have 1/2 the current handling capability.

Typical Relay Life*

| Voltage & Type of Load | Operating Current | Operations |
|------------------------|-------------------|------------|
| 24VDC Resistive | 6.3A | 600,000 |
| 24VDC Solenoid | 0.2A | 1,000,000 |
| 120VAC Resistive | 6.3A | 600,000 |
| 120VAC Resistive | 3A | 1,000,000 |
| 120VAC Solenoid | 0.5A | 500,000 |
| 240VAC Resistive | 6.3A | 450,000 |
| 240VAC Resistive | 3A | 600,000 |
| 1/4 HP Motor | 1.5 x FLA (motor) | 30,000 |

*Ratings are for normally-open contacts. Normally-closed contacts have 1/2 the current handling capability.

Output Derating



All 8 outputs on, 100% duty cycle allowed.

We recommend using prewired ZIPLink cables and connection modules. See "Wiring Systems".

Terminal block cover included. If you wish to hand-wire your module, a removable terminal block is sold separately. Order part number P3-RTB.



Removable Terminal Block Specifications

| | |
|--------------------|---|
| Description | Part No. P3-RTB; 20 screw terminals |
| Wire Range | 22-14 AWG (0.324 to 2.08 sq. mm) Solid / stranded conductor 3/64 in. (1.2 mm) insulation maximum *USE COPPER CONDUCTORS, 60°C or equivalent. |
| Screw Driver Width | 1/4 inch (6.5 mm) maximum |
| Screw Size | M3 size |
| Screw Torque | Field terminals – 7 - 9 in./lb (.0882 - 1.02 Nm) Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm). Do not overtighten screws when installing terminal block. |

WARNING: Explosion hazard – Substitution of components may impair suitability for Class I, Division 2.

Relay Output Modules

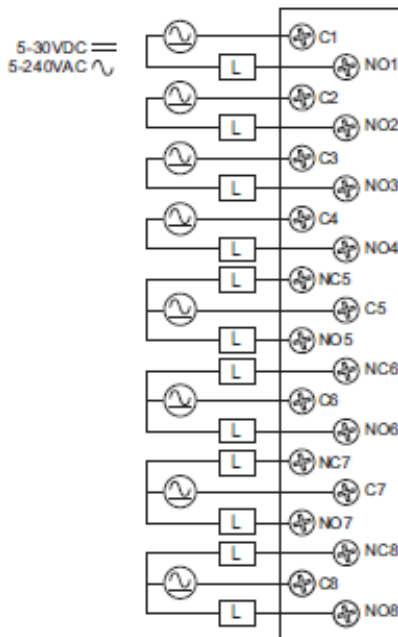
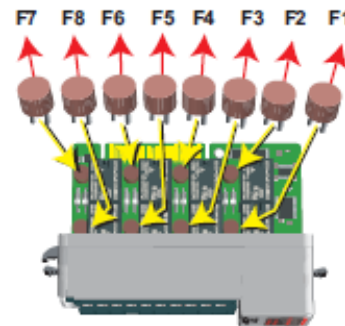
P3-08TRS-1 (cont'd)

| General Specifications | |
|-------------------------------|--|
| Operating Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Field to Logic Side Isolation | 1800VAC applied for 1 second |
| Insulation Resistance | >10MΩ @ 500 VDC |
| Heat Dissipation | 3W |
| Enclosure Type | Open Equipment |
| Agency Approvals | UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2*) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only. |
| Module Keying to Backplane | Electronic |
| Module Location | Any I/O slot in any local, expansion, or remote base in a Productivity3000 System. |
| Field Wiring | Removable terminal block (not included). Use ZIPLink wiring system or optional terminal block. See "Wiring I/O Modules". |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at: www.productivitypac.com |
| Terminal Type (not included) | 20-position removable terminal block |
| Weight | 286g (10.08 oz) |

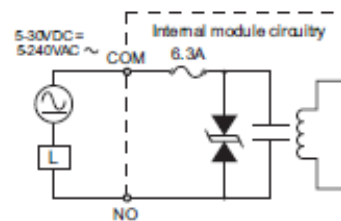
*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

Replaceable Fuses

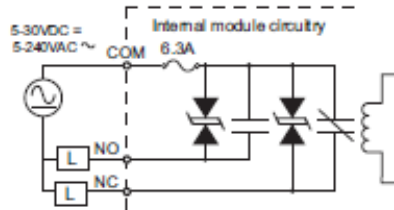
Order Part Number **P3-FUSE-2** (Qty. 5/Pkg.) One spare included with this module.



Outputs NO1 - NO4



Outputs NO5 / NC5 - NO8 / NC8





Specify your ZIPLink system

Use the Compatibility Matrix table below.

| | |
|---------------|---|
| Step 1 | Locate the I/O module part number. |
| Step 2 | Locate Connector Module Type. (Feedthrough Module, Fuse Module, etc...) |
| Step 3 | Select the cable length by replacing the # symbol with: Blank = 0.5m, -1 = 1.0m, -2 = 2.0m ¹ |

¹Note: Cable part number denotes compatibility between Connector Module and I/O Modules.

| Productivity3000 ZIPLink Wiring System Compatibility Matrix | | | | | | | | |
|---|---------------------|----------------------|------------------|----------------------|------------------|---------------------|---------------------|-----------------------|
| Step 2: Connector Module Type | | Feedthrough Modules | | Fuse Modules | | Relay Module | Sensor Input Mod. | Pigtail Cable |
| Step 1: I/O Module | Number of Terminals | ZL-RTB20 | ZL-RTB40 | ZL-RFU20 | ZL-RFU40 | ZL-RL16-24 | ZL-LTB16-24 | |
| Step 3: Cables | | | | | | | | |
| Inputs | | | | | | | | |
| <u>P3-08NAS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08ND3S</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16NA</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16ND3</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-32ND3</u> | 40 | | <u>ZL-CBL40#</u> | | | | <u>ZL-P3-CBL40#</u> | |
| <u>P3-64ND3*</u> | 40 | | <u>ZL-CBL40#</u> | | | | <u>ZL-P3-CBL40#</u> | |
| Outputs | | | | | | | | |
| <u>P3-08TAS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TD1S</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TD2S</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TRS</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TA</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20L#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TD1</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TD2</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16TR</u> | 20 | <u>ZL-P3-CBL20#</u> | | <u>ZL-P3-CBL20#</u> | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08TRS-1***</u> | 20 | <u>ZL-P3-CBL20#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-32TD1</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-32TD2</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-64TD1*</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| <u>P3-64TD2*</u> | 40 | | <u>ZL-CBL40#</u> | | <u>ZL-CBL40#</u> | | | |
| Analog In | | | | | | | | |
| <u>P3-04ADS</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08AD</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16AD-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16AD-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08RTD**</u> | Matched Only | | | | | | | |
| <u>P3-08THM**</u> | T/C Wire Only | | | | | | | |
| Analog Out | | | | | | | | |
| <u>P3-04DA</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-08DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-06DAS-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-06DAS-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-16DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| Analog Combo | | | | | | | | |
| <u>P3-8AD4DA-1</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |
| <u>P3-8AD4DA-2</u> | 20 | <u>ZL-P3-CBL20L#</u> | | | | | | <u>ZL-P3-CBL20-#P</u> |

*The P3-64ND3, P3-64TD1, and P3-64TD2 modules have two 32-point connectors and require 2 ZIPLink cables and 2 ZIPLink connector modules.

**These modules are not supported by the ZIPLink wiring system. Removable terminal block P3-RTB included.

***The P3-08TRS-1 output module is derated, not to exceed 2A per point maximum when used with the ZIPLink wiring system.

I/O Modules

A variety of discrete and analog I/O modules are available for use in local, expansion, and remote I/O bases. Specifications for each module are on the following pages.

A filler module is available for unused I/O module slots (part number [P3-FILL](#)).



Discrete Input Modules

| Productivity3000 Discrete Input Modules | | | |
|---|------------------|------------------------------------|-------|
| Part Number | Number of Inputs | Description | Price |
| P3-16SIM | 16 | Input Simulator Module | ↔ |
| P3-08ND3S | 8 | Isolated Sinking/Sourcing DC Input | ↔ |
| P3-16ND3 | 16 | Sinking/Sourcing DC Input | ↔ |
| P3-32ND3* | 32 | Sinking/Sourcing DC Input | ↔ |
| P3-64ND3* | 64 | Sinking/Sourcing DC Input | ↔ |
| P3-08NAS | 8 | Isolated AC Input | ↔ |
| P3-16NA | 16 | AC Input | ↔ |

*ZIPLink required.

Analog I/O Modules

| Productivity3000 Analog Input Modules | | | |
|---------------------------------------|--------------------|---------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-04ADS | 4 | Isolated Analog Input | ↔ |
| P3-08AD | 8 | Analog Input | ↔ |
| P3-16AD-1 | 16 | Analog Input (Current) | ↔ |
| P3-16AD-2 | 16 | Analog Input (Voltage) | ↔ |
| P3-08RTD | 8 | Analog RTD Input | ↔ |
| P3-08THM | 8 | Analog Thermocouple Input | ↔ |

| Productivity3000 Analog Output Modules | | | |
|--|--------------------|----------------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-04DA | 4 | Analog Output | ↔ |
| P3-08DA-1 | 8 | Analog Output (Current) | ↔ |
| P3-08DA-2 | 8 | Analog Output (Voltage) | ↔ |
| P3-06DAS-1 | 6 | Isolated Analog Output (Current) | ↔ |
| P3-06DAS-2 | 6 | Isolated Analog Output (Voltage) | ↔ |
| P3-16DA-1 | 16 | Analog Output (Current) | ↔ |
| P3-16DA-2 | 16 | Analog Output (Voltage) | ↔ |

| Productivity3000 Analog Input/Output Modules | | | |
|--|--------------------|-------------------------------|-------|
| Part Number | Number of Channels | Description | Price |
| P3-8AD4DA-1 | 8/4 | Analog Input/Output (Current) | ↔ |
| P3-8AD4DA-2 | 8/4 | Analog Input/Output (Voltage) | ↔ |

Discrete Output Modules

| Productivity3000 Discrete Output Modules | | | |
|--|-------------------|--------------------------|-------|
| Part Number | Number of Outputs | Description | Price |
| P3-08TD1S | 8 | Isolated Sinking Output | ↔ |
| P3-08TD2S | 8 | Isolated Sourcing Output | ↔ |
| P3-16TD1 | 16 | Sinking Output | ↔ |
| P3-16TD2 | 16 | Sourcing Output | ↔ |
| P3-32TD1* | 32 | Sinking Output | ↔ |
| P3-32TD2* | 32 | Sourcing Output | ↔ |
| P3-64TD1* | 64 | Sinking Output | ↔ |
| P3-64TD2* | 64 | Sourcing Output | ↔ |
| P3-08TAS | 8 | Isolated AC Output | ↔ |
| P3-16TA | 16 | AC Output | ↔ |
| P3-08TRS | 8 | Isolated Relay Output | ↔ |
| P3-16TR | 16 | Relay Output | ↔ |
| P3-08TRS-1 | 8 | Isolated Relay Output | ↔ |

*ZIPLink required.

Module Installation Procedure



WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

Step One: Align circuit card with slot and press firmly to seat module into connector.

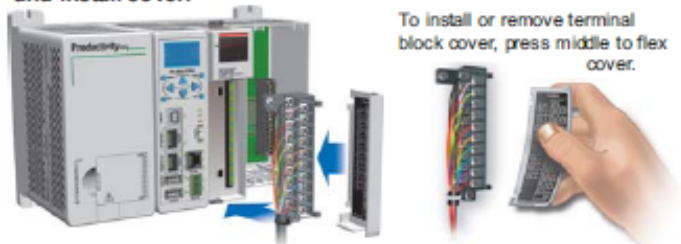
Step Two: Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.



Step Three: Attach field wiring using optional terminal block or ZIPLink wiring system and install cover.



To install or remove terminal block cover, press middle to flex cover.



WARNING: Explosion hazard – Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous. Do not hot-swap modules unless the area is known to be non-hazardous.

SOLA HEVI-DUTY 24V POWER SUPPLY**[RELATED SECTION 25 35 23]**

Model Number: SDP 4-24-100LT

Location: Main House Mechanical Closet

Dimensions:

Width: 2-7/8" [73 mm]

Height: 2-7/16" [75 mm]

Depth: 3-7/8" [97 mm]

Weight: 0.7 lbs [.32 kg]

Electrical:

Input Voltage: 85-132 / 176-264 Vac, 210-376 Vdc

Input Frequency: 47-63 Hz

Input Current: 1.8 A / 1 A

Output Current: 3.8 A

Output Voltage: 24-28 Vdc

Approval Certificates:

UL Listed

CSA Listed

Available: Sola/Hevi-Duty



SDP™ Low Power DIN Rail Series

The compact, lightweight DIN Rail power supplies come in output voltages from 5 to 48 Vdc and power ratings of up to 100 Watts. These extra small, efficient units are designed specifically for the industrial environment. Each unit is rated from -10°C to 70°C, with no derating necessary until above 60°C.

Many extra "industrial" features are standard for the SDP PowerBoost™ overload circuitry can start up industrial loads (i.e. motors, relays, solenoids and DC-DC converters), that can cause ordinary power supplies to foldback or shutdown. Each unit contains a DC indicator and front panel adjustment potentiometer. With the Sola SDP series, you can count on a high grade design.



UL 508 Listed
IND. CONT.
EQ.E68379



UL 60950
E137632
CUL/CSA-C22.2
No. 234-M90



EMC and
Low Volt.
Directive

Features

- Ultra slim 15W footprint
- No tools required for mounting
- Adjustable output
- PowerBoost™ industrial overload design
- Overvoltage, short circuit protection
- NEC Class 2 Current Limited
- Continuous short circuit protection
- Low output noise
- Screw terminal connections
- RoHS Compliant
- Three year warranty

Related Products

- SDN™ Series
- SCP Series
- SCL Series

Applications

- Industrial Control
- Process Control
- Machine Control
- Building Automation
- Instrumentation

Selection Table

| Catalog Number | DC Output Voltage | Output Current | Ripple / Noise | Size (H x W x D) |
|-----------------|-------------------|----------------|----------------|---|
| SDP 5-5-100T | 5 - 6 V | 5 A | <50 mVpp | 2.95 in x 1.77 in x 3.58 in (75 mm x 45 mm x 91 mm) |
| SDP 2-12-100T | 10 - 12 V | 3 - 2.5 A | | |
| SDP 3-15-100T | 12 - 15 V | 4.2 - 3.4 A | | |
| SDP 1-48-100T | 48 - 58 V | 1 A | | |
| SDP 06-24-100T | 24-28 Vdc | 0.6 A | | 2.95 in x 0.9 in x 3.8 in (75 mm x 22.8 mm x 96.7 mm) |
| SDP 1-24-100T | | 1.3 A | | 2.95 in x 1.77 in x 3.58 in (75 mm x 45 mm x 91 mm) |
| SDP 2-24-100T | | 2.1 A | | 2.95 in x 2.85 in x 3.8 in (75 mm x 72.5 mm x 96.7 mm) |
| SDP 4-24-100LT | | 3.8 A | | |
| SDP 4-24-100RT* | | 4.2 A | | |

* NEO Class 1

Visit our website at www.solahd.com or
contact Technical Services at (800) 377-4384 with any questions.

SDP™ Series Specifications (24 V models)

| Description | Catalog Number | | | | |
|--|---|--|--|---|---|
| | SDP 06-24-100T | SDP 1-24-100T | SDP 2-24-100T | SDP 4-24-100LT | SDP 4-24-100RT |
| Input | | | | | |
| Input Voltage ¹ | 85-264 V _{ac} , 90-375 V _{dc} | | | 85-132 / 176-264 V _{ac} , 210-375 V _{dc} | |
| Input Frequency | 47-63 Hz | | | | |
| Input Current | 0.4 A / 0.25 A | 0.7 A / 0.4 A | 1.1 A / 0.7 A | 1.8 A / 1.0 A | 2.2 A / 1.2 A |
| External Fusing | Not required. Unit provides internal fuse (T3A, not accessible) | | | | |
| Hold-Up Time | > 25 ms | | | | |
| Efficiency | > 80% typ. | > 83% typ. | > 86% typ. | > 88% typ. | |
| Losses | < 3.75 W typ. | < 6.1 W typ. | < 8.1 W typ. | < 12 W typ. | |
| Output | | | | | |
| Output Voltage | 24 V (22.5 - 26.5 V _{dc} Adj.) | | | 24 V (24 - 26.7 V _{dc} Adj.) | 24 V (22.5 - 26.5 V _{dc} Adj.) |
| Voltage Regulation | Static 0.6% V _{out} , dynamic + 2% V _{out} overall ² | | | | |
| Ripple/Noise ² | < 60 mVpp | | | | |
| Overvoltage Protection (OVP) | > 30 V _{dc} , but < 33 V _{dc} , auto recovery | | | > 28 V _{dc} , but < 27.2 V _{dc} , auto recovery | > 30 V _{dc} , but < 33 V _{dc} , auto recovery |
| Output Noise Suppression | Radiated EMI values below EN61000-6-2 | | | | |
| Rated Continuous Loading | 0.63 A @ 24 V _{dc} / 0.64 A @ 28 V _{dc} | 1.3 A @ 24 V _{dc} / 1.1 A @ 28 V _{dc} | 2.1 A @ 24 V _{dc} / 1.8 A @ 28 V _{dc} | 3.8 A @ 24.5 V _{dc} | 4.2 A @ 24.5 V _{dc} / 3.8 A @ 28 V _{dc} |
| Overload Behavior | Continuous operation at overload/short-circuit: up to 1.5 x Nominal Current Continuous | | | | |
| Protection | Unit is continuously protected against short-circuit, overload and open-circuit. | | | | |
| Power Back Immunity | 35 V | | | | |
| Installation | | | | | |
| Status Indicators | Green LED on, when V _{out} "OK". | | | | |
| Case & Mounting | Molded plastic housing using UL 94 approved flameproof material rating 94V-2. Simple snap-on to DIN TS35/7.5 or TS35/15 rail system. | | | | |
| Dimensions | | | | | |
| (H x W x D) (in/mm) | 2.95 x 0.9 x 3.8 (75 x 22.8 x 96.7) | 2.95 x 1.77 x 3.68 (75 x 45 x 91) | | 2.95 x 2.85 x 3.8 (75 x 72.5 x 96.7) | |
| Weight - lbs (kg) | 0.85 lbs (.18 kg) | 0.6 lbs (.28 kg) | | 0.7 lbs (.32 kg) | |
| Mounting Orientation | Standard: Vertical; Optional: Horizontal or on top (Contact Technical Services). | | | | |
| Ventilation/Cooling •Free space for cooling | Normal convection, no fan required; Above/below: 25 mm recommended. | | | | |
| Connection •Connector size range | Input: screw terminals, connector size range: 20-12AWG (1.5 - 6 mm ²) for solid or stranded conductors. | | | | |
| General | | | | | |
| Temperature | Storage: -25°C...+85°C Operation: -10°C...+80°C full power with linear derating to half power from 60°C to 70°C. (Convection cooling, no forced air required). | | | | |
| MTBF | > 500,000 hours according to Telcordia/Bellcore Document GR-332, Issue 1. | | | | |
| Humidity | Up to 90% RH, noncondensing; IEC 68-2-2, 68-2-3 | | | | |
| Electromagnetic Emissions (EME) | EN61000-6-3 (Includes EN61000-6-4) Class B (EN 55022) Incl. Annex A | | | | |
| Electromagnetic Immunity (EMI) | EN61000-6-2 (Includes EN61000-6-1) (EN55024) Criterion A: no derogation of performance | | | | |
| Safe Low Voltage | SELV (acc. EN60950) | | | | |
| Protection Class/Voltage | IP20 (IEC529), Protection Class 1 (IEC536) | | | | |
| Warranty | 3 years | | | | |
| Safety | | | | | |
| OB Scheme, EN60950, UL60079-15 (Class 1, Zone 2 Hazardous Locations, Temp Class T3), UL508 Listed, cULus, UL 60950, cURus, OE (LVD 73/23 & 93/68/EEO), (EMO 89/336 & 93/68/EEO), EN61000-3-2, NEMO Class 2 power supply acc. To NFPA 70 art. 726-41 (a)(2). ³ | | | | | |

Notes:

- Not UL listed for DO input.
- Ripple/noise is stated as typical values when measured with a 20 MHz, bandwidth scope and 50 Ohm resistor.
- For all models except SDP 4-24-100LT.

Visit our website at www.solahd.com or
contact Technical Services at (800) 377-4384 with any questions.

SOLA HEVI-DUTY 12V POWER SUPPLY**[RELATED SECTION 25 35 23]**

Model Number: SDP-2-12-100T

Location: Main House Mechanical Closet

Dimensions:

Width: 1-3/4" [45 mm]

Height: 2-7/16" [75 m]

Depth: 3-7/8" [97 mm]

Weight: 0.5 lbs [.23 kg]

Electrical:

Input Voltage: 85-264 Vac, 90-375 Vdc

Input Frequency: 47-63 Hz

Input Current: 0.6 A @102 Vac, 0.33 A @ 196 Vac

Output Current: 3-2.5 A

Output Voltage: 10-12 V

Approval Certificates:

UL Listed

CSA Listed

Available: Sola/Hevi-Duty



SDP™ Low Power DIN Rail Series

The compact, lightweight DIN Rail power supplies come in output voltages from 5 to 48 Vdc and power ratings of up to 100 Watts. These extra small, efficient units are designed specifically for the industrial environment. Each unit is rated from -10°C to 70°C, with no derating necessary until above 60°C.

Many extra "industrial" features are standard for the SDP PowerBoost™ overload circuitry can start up industrial loads (i.e. motors, relays, solenoids and DC-DC converters), that can cause ordinary power supplies to foldback or shutdown. Each unit contains a DC indicator and front panel adjustment potentiometer. With the SolaHD SDP series, you can count on a high grade design.



UL 508 Listed
IND. CONT.
EQ.E68379



UL 60950
E137832
CUL/CSA-C22.2
No. 234-M90



EMC and
Low Volt.
Directive

Features

- Ultra slim 15W footprint
- No tools required for mounting
- Adjustable output
- PowerBoost™ industrial overload design
- Overvoltage, short circuit protection
- NEC Class 2 Current Limited
- Continuous short circuit protection
- Low output noise
- Screw terminal connections
- RoHS Compliant
- Three year warranty

Related Products

- SDN™ Series
- SCP Series
- SCL Series

Applications

- Industrial Control
- Process Control
- Machine Control
- Building Automation
- Instrumentation

Selection Table

| Catalog Number | DC Output Voltage | Output Current | Ripple / Noise | Size (H x W x D) |
|-----------------|-------------------|----------------|----------------|---|
| SDP 5-5-100T | 5 - 6 V | 5 A | <50 mVpp | 2.95 in x 1.77 in x 3.58 in (75 mm x 45 mm x 91 mm) |
| SDP 2-12-100T | 10 - 12 V | 3 - 2.5 A | | |
| SDP 3-15-100T | 12 - 15 V | 4.2 - 3.4 A | | |
| SDP 1-48-100T | 48 - 58 V | 1 A | | |
| SDP 06-24-100T | 24-28 Vdc | 0.6 A | | 2.95 in x 0.9 in x 3.8 in (75 mm x 22.8 mm x 96.7 mm) |
| SDP 1-24-100T | | 1.3 A | | 2.95 in x 1.77 in x 3.58 in (75 mm x 45 mm x 91 mm) |
| SDP 2-24-100T | | 2.1 A | | |
| SDP 4-24-100LT | | 3.8 A | | 2.95 in x 2.85 in x 3.8 in (75 mm x 72.5 mm x 96.7 mm) |
| SDP 4-24-100RT* | | 4.2 A | | |

* NEC Class 1

SDP™ Series Specifications (Other Voltages)

| Description | Catalog Number | | | |
|---|---|------------------------------|-------------------------------------|---------------------------------------|
| | SDP 5-5-100T | SDP 2-12-100T | SDP 3-15-100T | SDP 1-48-100T |
| Input | | | | |
| Input Voltage ¹ | 85-264 Vac, 90-375 Vdc | | | |
| Input Frequency | 47-63 Hz | | | |
| Input Current | 0.6 A @ 102 Vac; 0.63 A @ 196 Vac | | 1.0 A @ 102 Vac; 0.6 A @ 196 Vac | <1.0 A @ 100 Vac; <0.6 A @ 196 Vac |
| External Fusing | Not required. Unit provides internal fuse (T3A, not accessible) | | | |
| Hold-Up Time | > 25 ms | | | |
| Efficiency | > 80% typ. | | > 86% typ. | > 90% typ. |
| Losses | 7.5 W typ. | 8.1 W typ. | < 8.1 W typ. | |
| Output | | | | |
| Output Voltage | 5 - 5.5 Vdc (5 - 6 min adj.) | 12 Vdc (9.9 - 12.1 min adj.) | 15 Vdc (11.9 - 15.1 min adj.) | 48 Vdc (48 - 56 min adj.) |
| Voltage Regulation | < 2% Dynamic; < 0.5% Static | | | |
| Ripple/Noise ² | < 50 mVpp | | | |
| Overvoltage Protection (OVP) | > 6.7 Vdc | > 18 Vdc | > 20 Vdc | > 56 Vdc |
| Output Noise Suppression | Radiated EMI values below EN61000-6-2 | | | |
| Rated Continuous Loading | $I_{out} = 5A @ V_{out} = 5.1V$ | 3A @ 10 Vdc 2.5A @ 12 Vdc | 4.2A @ 12 Vdc 3.4A @ 15 Vdc | Up to 1.05A @ 48 V 0.9A @ 56 V |
| Overload Behavior | Continuous operation at overload/short-circuit: up to 1.5 x Nominal Current Continuous | | | |
| Protection | Unit is continuously protected against short-circuit, overload and open-circuit. | | | |
| Power Back Immunity | 10 V | 22 V | | 80 V |
| Installation | | | | |
| Status Indicators | Green LED on, when V_{out} "OK". | | | |
| Case & Mounting | Molded plastic housing using UL 94 approved flameproof material rating 94V-2. Simple snap-on to DIN TS35/7.5 or TS35/15 rail system. | | | |
| Dimensions | | | | |
| (H x W x D) (in/mm) | 2.95 x 1.77 x 3.58 (75 x 45 x 91) | | | |
| Weight - lbs (kg) | 0.5 lbs (.23 kg) | | | |
| Mounting Orientation | Standard: Vertical; Optional: Horizontal or On Top (Contact Technical Services). | | | |
| Ventilation/Cooling •Free space for cooling | Normal convection, no fan required; Above/below: 25 mm recommended. | | | |
| Connection •Connector size range | Input: screw terminals, connector size range: 20-12 AWG (1.5 - 6 mm ²) for solid or stranded conductors. | | | |
| General | | | | |
| Temperature | Storage: -25°C...+85°C Operation: -10°C...+60°C full power with linear derating to half power from 60°C to 70°C. (Convection cooling, no forced air required). | | | |
| MTBF | > 500,000 hours according to Telcordia/Bellcore Document GR-332, Issue 1. | | | |
| Humidity | Up to 90% RH, noncondensing; IEC 68-2-2, 68-2-3 | | | |
| Electromagnetic Emissions (EME) | EN61000-6-3 (Includes EN61000-6-4) Class B (EN 55022) incl. Annex A | | | |
| Electromagnetic Immunity (EMI) | EN61000-6-2 (Includes EN61000-6-1) (EN55024) Criterion A: no degradation of performance | | | |
| Safe Low Voltage | SELV (acc. EN60950) | | | |
| Protection Class/Voltage | IP20 (IEC629), Protection Class 1 (IEC636) | | | |
| Warranty | 3 years | | | |
| Safety | | | | |
| CB Scheme, EN60950, UL60079-15 (Class 1, Zone 2 Hazardous Locations, Temp Class T3), UL508 Listed, cULus, UL 60950, cURus, OE (LVD 73/23 & 93/68/EEC), (EMC 89/336 & 93/68/EEC), EN61000-3-2, NEO Class 2 power supply acc. To NFPA 70 art. 725-41 (a)(2). ³ | | | | |

Notes:

1. Not UL listed for DC input.
2. Ripple/noise is stated as typical values when measured with a 20 MHz, bandwidth scope and 50 Ohm resistor.
3. Not to exceed 60 watts total.

BELIMO DAMPER**[RELATED SECTION 25 35 23]**

Model Number: TF24 US

Location: Main House Mechanical Closet

Dimensions:

Width: 6-1/4" [160 mm]

Height: 3" [76 mm]

Depth: 3-3/8" [84 mm]

Features:

Two-position actuator

Spring return fail safe mode

Rotary

Torque: 18 lb-in

Ambient temperature: -22°F - 122°F

Electrical:

Power supply: 24 Vac \pm 20%

Power consumption: 2 W running, 1.3 W holding

Available: PEXSupply.com

Price: \$129.95





Spring Return Fail-Safe, On/Off Damper Control Actuator, Direct Coupled - 24 VAC/DC (No Aux Switch)

SKU: TF24 Brand: Belimo


 ★★★★★ Be the first to [Write a Review](#)

| QTY | PRICE |
|--------------------------------|-----------------|
| <input type="text" value="1"/> | \$129.95 / each |

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Specs

| | |
|-------------------------------|---|
| Actuator Type: | Two-Position |
| Fail Safe Mode: | Spring Return |
| Type: | Rotary |
| Power Supply: | 24 VAC/DC |
| Torque: | 18 lb-in |
| Running Time: | < 75 Seconds (motor) < 25 Seconds @ 4°F to 122°F (spring) < 60 Seconds @ -22°F (spring) |
| Power Consumption: | 2.5W (running) 1.3W (holding) |
| VA Rating: | 5 VA |
| Ambient Temperature: | -22°F to +122°F |
| Control Input Values: | On/Off |
| Auxiliary Switch: | No Switch |
| Manual Override: | Yes |
| Direction of Rotation: | Reversible w/ cw/ccw mounting |
| Warranty: | 5-Year Limited Warranty |

Description for Belimo TF24

Features

- Easy-to-adjust mechanical stop to limit damper rotation.
- Cut labor costs with simple direct coupling. Actuator Centers on 1/2" shaft.
- Clockwise or counterclockwise fail-safe mounting for fail-safe.
- Compact size with the shortest shaft-center to edge distance in the industry - 0.77".
- True mechanical spring return - the most reliable fail-safe.
- Single line voltage model for on/off application has 100 to 240V (-15/+10%), 50/60 Hz supply power.
- Check damper position easily with clear position indicator.
- Don't worry about actuator burn-out. Belimo is overload-proof throughout rotation.
- Need to change control direction? Do it easily with a simple switch (modulating actuators).
- Built-in auxiliary switch is easy to use, offers feedback or signal for additional device.
- Microprocessor-controlled brushless DC motor increases actuator life span and reliability, provides constant running time (modulating actuators).
- Rugged housing withstands rough handling in the mechanical room.
- 3 ft. standard cable and conduit connector (not shown) eases installation.

The TF24 is used for On/Off, fail-safe control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. Control is On/Off from an auxiliary contact, or a manual switch.

The TF series actuators provide true spring return operation for reliable fail-safe application and positive close off on air tight dampers. The spring return system provides consistent torque to the damper with, and without, power applied to the actuator.

TF24(-S) US

On/Off, Spring Return, 24 V



| Technical Data | | TF24(-S) US |
|---------------------------|---------------|--|
| Power supply | | 24VAC ± 20%, 50/60Hz 24VDC ± 10% |
| Power consumption | running | 2 W |
| | holding | 1.3 W |
| Transformer sizing | | 5 VA (class 2 power source) |
| Electrical connection | | 3 ft, 18 GA appliance cable |
| (-S models have 2 cables) | | 1/2" conduit connector |
| Overload protection | | electronic throughout 0 to 95° rotation |
| Angle of rotation | | max 95°, adjust. with mechanical stop |
| Torque | | min. 18 in-lb [2 Nm] |
| Direction of rotation | | reversible with cw/ccw mounting |
| Position indication | | visual indicator, 0° to 95° (0° spring return position) |
| Running time (nominal) | motor | < 75 sec (0 to 18 in-lb) |
| | spring | < 25 sec @ -4°F to 122°F [-20°C to 50°C] < 60 sec @ -22°F [-30°C] |
| Humidity | | 5 to 95% HH non-condensing |
| Ambient temperature | | -22°F to 122°F [-30°C to 50°C] |
| Storage temperature | | -40°F to 176°F [-40°C to 80°C] |
| Housing | | NEMA type 2 / IP42, UL enclosure type 2 |
| Housing material | | UL94-5VA |
| Agency listings† | | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1-02, CE acc. to 2004/108/EC (and 2006/95/EC for -S versions) |
| Noise level (max) | running | < 50 db (A) |
| | spring return | 62 db (A) |
| Servicing | | maintenance free |
| Quality standard | | ISO 9001 |
| Weight | TF24 | 1.4 lbs (0.6 kg) |
| | TF24-S | 1.5 lbs (0.7 kg) |

† Rated Impulse Voltage 800V, Type of action 1AA (1AAB for -S version), Control Pollution Degree 3.

| TF24-S US | |
|------------------|--|
| Auxiliary switch | 1 x SPDT 3A (0.5A) @ 250 VAC, UL approved adjustable 0° to 95° |

Torque min. 18 in-lb, for control of air dampers

Application

For On/Off, fail-safe control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. Control is On/Off from an auxiliary contact, or a manual switch.

The actuator is mounted directly to a damper shaft from 1/4" up to 1/2" in diameter by means of its universal clamp, 1/2" shaft centered at delivery. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

Operation

The TF series actuators provide true spring return operation for reliable fail-safe application and positive close off on air tight dampers. The spring return system provides consistent torque to the damper with, and without, power applied to the actuator.

The TF series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 90°.

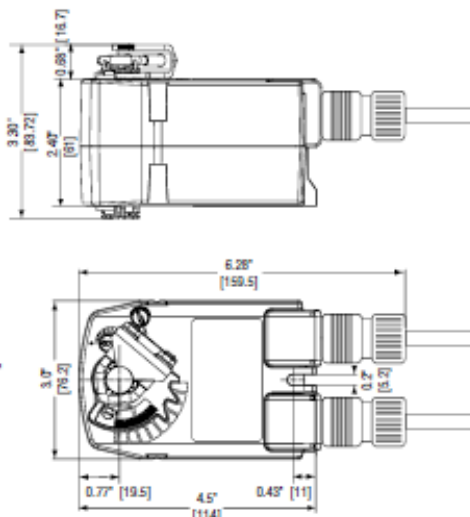
The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. Power consumption is reduced in holding mode.

The TF24-S US versions are provided with one built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable between 0° and 95°.

SAFETY NOTE

Screw a conduit fitting into the actuator's bushing. Jacket the actuator's input and output wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

Dimensions (Inches [mm])



M-40024 - 05/10 - Subject to change. © Belimo Aircontrols (USA), Inc.

Accessories

| | |
|----------|--------------------------------------|
| Tool-06 | 8mm and 10 mm wrench |
| KH-TF | Crank arm for up to 1/2" round shaft |
| ZG-TF2 | Crank arm adaptor kit for TF |
| ZG-TF112 | Mounting bracket, kit for TF |
| ZS-100 | Weather shield (metal) |
| ZS-150 | Weather shield (polycarbonate) |

NOTE: When using TF24 US and TF24-S US actuators, only use accessories listed on this page.

For actuator wiring information and diagrams, Please See Belimo Wiring Guide (pg 349).

Typical Specification

On/Off spring return damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a shaft up to a 1/2" diameter and center a 1/2" shaft. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, one SPDT auxiliary switch shall be provided having the capability of being adjustable. Actuators with auxiliary switch must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be cULus listed certified, have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

✂ INSTALLATION NOTES

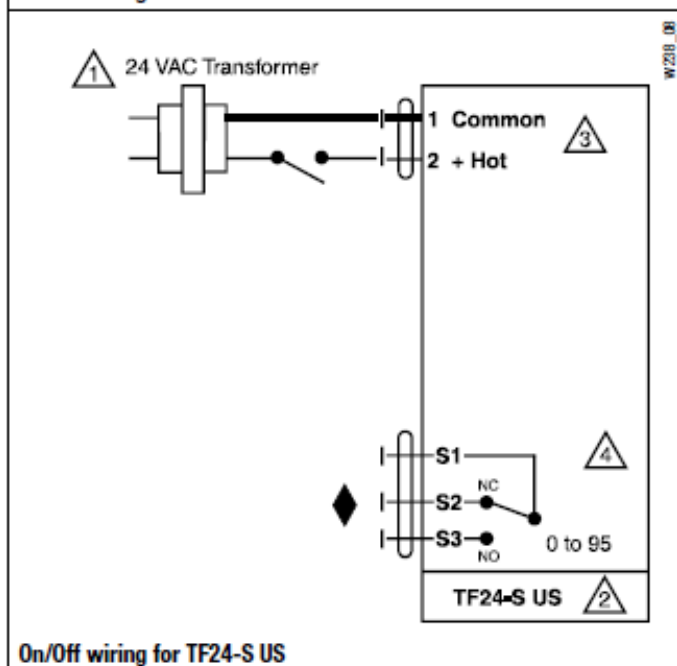
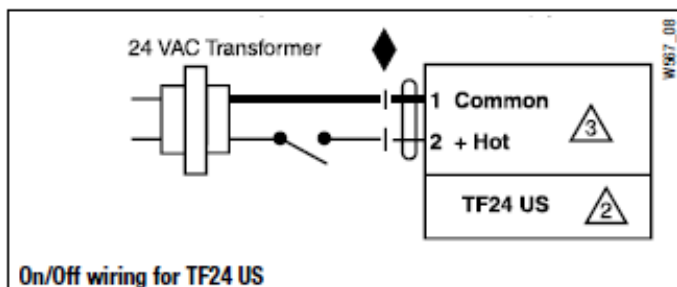
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**
Actuators may be connected in parallel. Power consumption must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 For end position indication, interlock control, fan startup, etc., TF24-S US incorporates a built-in auxiliary switch: 1 x SPDT, 3A (0.5A) @250 VAC, UL Approved, adjustable 0 to 95.

📄 APPLICATION NOTES

- ◆ Meets cULus requirements without the need of an electrical ground connection.

⚠ WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



DIVISION 26 **ELECTRICAL**

ARLINGTON GB5 GROUNDING BRIDGE

[RELATED SECTION 26 05 26]

Model Number: 76095

Location: Outdoor Kitchen Mechanical Closet

Dimensions:

Length: 4-3/8"

Width: 1-5/6"

Height: 1-1/2"

Finish: zinc

Features:

Grounding Electrode or Equipment Grounding Conductor: #6 to #2 CU/AL

Handles multiple hookups of communication systems

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution





Intersystem Grounding Bridges

Available in zinc or bronze. Provides reliable intersystem bonding between power and communication grounding systems. Comes with textured, paintable, white cover. Cover is UV rated plastic for long outdoor life.

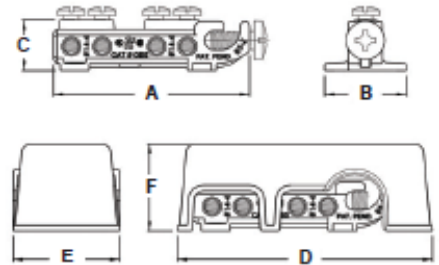
New!

| CATALOG NUMBER | UPC/DCI/NAED MFG #01 8997 | DESCRIP. | UNIT PKG | STD PKG | DIM A | DIM B | DIM C | DIM D | DIM E | DIM F |
|----------------|---------------------------|----------|----------|---------|-------|-------|-------|-------|-------|-------|
| GB5 | 76095 | Zinc | 1 | 10 | 3.383 | 1.409 | .872 | 4.398 | 1.836 | 1.497 |
| GBB5 | 76096 | Bronze | 1 | 10 | 3.383 | 1.409 | .872 | 4.398 | 1.836 | 1.497 |
| GBB50 | 09726 | Bronze | 1 | 10 | 3.383 | 1.409 | .872 | 4.398 | 1.836 | 1.497 |

PATENTS PENDING.



E75814 LR49636



GB5



GBB5



GBB50



GB5

Cable Range

- Four termination points for #4-#14 (solid or stranded)
- Attaches to conductor with "Lay in" style lug with cable range of #6-#2
- GBB50 has larger cable range of #6-#1/0

Installation Instructions



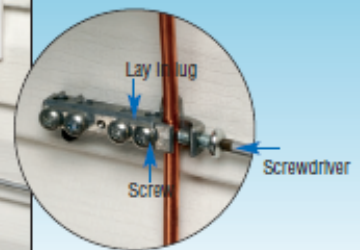
For a video installation demonstration visit our website @ aifittings.com



1 Attach grounding bridge to substrate. (Mounting screws not provided.)



2 Insert grounding electrode conductor into the lay in lug. Tighten screw.



3 Finish by attaching the cover. Good looks, a great finish.

Features and Benefits

- Meets 2008 NEC Ground Requirements
- GB5 has **four** termination points one more than required by 250.94 of the 2008 NEC
- Available in Zinc and Bronze
- Handles multiple hookups of communications systems – for instance phone, cable TV, or a satellite dish
- Fast, simple installation on grounding conductor
- Plastic cover is textured and paintable for good looks

IDEAL SPLIT BOLT CONNECTOR

[RELATED SECTION 26 05 26]

Model Number: 6921K58

Location: Outdoor Kitchen Mechanical Closet

Finish: copper

Features:

Wire range: 87 solid to 4 solid

Minimum tap size: 16 solid

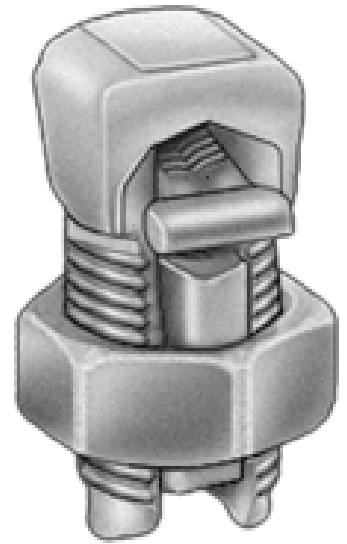
Recommended torque: 165 in-lbs

Electrical:

Voltage: 600 V

Available: McMaster-Carr

Price: \$3.89



Search Results

Split Bolt Connectors

+ Additional Connectors

Wire Connectors & Lugs

For information about wire size (AWG), see [page 742](#).

Split-Bolt Connectors



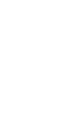
Use these connectors for tapping and splicing wire. No special installation tools are needed—just strip wires, insert, and tighten. Insulate with tape in power applications and corrosive environments. All connectors are rated to 600 volts and 194° F. UL listed and CSA certified.

Copper splices are for use with copper and copper weld wire. Suitable for direct burial, except [6921K68](#). **Aluminum splices** can be used with any combination of copper and aluminum wire.

Main Wire Range (AWG) describes wire range with equal size main and tap wires. **Min. Tap Wire Size (AWG)** describes minimum wire size with one max. size main wire.



Copper



Aluminum

| Main Wire Range (AWG) | | Min. Tap Wire Size (AWG) | Wire Slot Wd. (A) | Head Wd. (B) | | Each |
|---|--------------|--------------------------|-------------------|--------------|--------------------------|--|
| Copper | | | | | | |
| 16 Stranded | 8 Stranded | 16 Stranded | 0.15" | 0.38" | 6921K56 | \$2.82 |
| 10 Solid | 6 Solid | 16 Solid | 0.17" | 0.50" | 6921K57 | 3.29 |
| 8 Solid | 4 Solid | 16 Solid | 0.22" | 0.56" | 6921K58 | 3.89 |
| Catalog Page Bookmark | | | | | | |
| Split-Bolt Connector Copper, 8 Solid to 4 Solid, 600V | | | | | | <input type="checkbox"/> Each <input type="button" value="ADD TO ORDER"/> |
| In stock | | | | | | |
| 6 Solid | 2 Solid | 12 Solid | 0.33" | 0.69" | 6921K591 | 5.55 |
| 6 Solid | 2 Stranded | 14 Stranded | 0.33" | 0.69" | 6921K61 | 6.21 |
| 4 Solid | 1/0 Stranded | 14 Solid | 0.38" | 0.75" | 6921K62 | 8.03 |
| 2 Solid | 2/0 Stranded | 14 Stranded | 0.42" | 0.81" | 6921K63 | 12.97 |
| 2 Solid | 3/0 Stranded | 12 Solid | 0.47" | 0.88" | 6921K64 | 17.79 |
| 1/0 Solid | 250 MCM | 10 Solid | 0.58" | 1.00" | 6921K65 | 20.83 |
| 4/0 Stranded | 350 MCM | 8 Solid | 0.75" | 1.50" | 6921K66 | 31.20 |
| 250 MCM | 500 MCM | 8 Solid | 0.83" | 1.63" | 6921K67 | 40.49 |
| 350 MCM | 750 MCM | 8 Solid | 1.03" | 1.94" | 6921K68 | 68.43 |

| Main Wire Range (AWG) | | Min. Tap Wire Size (AWG) | Wire Slot Wd. (A) | Head Wd. (B) | | Each |
|-----------------------|--------------|--------------------------|-------------------|--------------|-------------------------|--------|
| Aluminum | | | | | | |
| 10 Solid | 6 Stranded | 10 Solid | 0.22" | 0.56" | 6921K81 | \$8.43 |
| 8 Solid | 4 Stranded | 10 Solid | 0.26" | 0.62" | 6921K82 | 11.63 |
| 6 Stranded | 2 Stranded | 8 Stranded | 0.32" | 0.69" | 6921K83 | 12.58 |
| 2 Stranded | 1/0 Stranded | 8 Stranded | 0.38" | 0.75" | 6921K84 | 15.99 |
| 2 Stranded | 2/0 Stranded | 8 Stranded | 0.44" | 0.88" | 6921K85 | 19.52 |
| 2 Stranded | 4/0 Stranded | 6 Stranded | 0.55" | 1.13" | 6921K86 | 35.05 |
| 1/0 Stranded | 350 MCM | 4 Stranded | 0.71" | 1.50" | 6921K87 | 62.03 |
| 400 MCM | 500 MCM | 2 Stranded | 0.85" | 1.73" | 6921K88 | 85.28 |

TE CONNECTIVITY SOLARLOK GROUNDING BOLT

[RELATED SECTION 26 05 26]

Model Number: 2106831-1

Location: Great Porch Canopy

Dimensions:

Diameter: 0.7"

Finish: stainless steel

Features:

Thread: #10-32 UNF

Use with wire sizes: 6 AWG, 7 or 19 stranded

Available: TE Connectivity





Solar Grounding Solutions Overview



SOLARLOK Grounding Clip

Training Video

[SOLARLOK Grounding Video](#)



SOLARLOK Ground Bolt

[Global Alternative Energy Sales](#)

[Contacts](#)
[Global Distributors Stocking Solar Products](#)

TE Connectivity (TE) has expanded its line of SOLARLOK photovoltaic (PV) interconnect products with our grounding products. The electrical and mechanical properties of these products will meet the tough requirements for PV module grounding applications as established by UL.

The SOLARLOK grounding clip provides quick and convenient grounding for solar modules and related products. These grounding clips have four points of electrical contact and are for use with 12-10 AWG uninsulated copper wire. Our grounding clips can be re-used up to 5 times. The ground terminal supplements the existing TE SOLARLOK product portfolio and offers the electrician yet another valuable component for simple and fast wiring of a PV-system.

The ground bolts are designed for solar module grounding applications using solid copper uninsulated 6 AWG to 12 AWG wire. The grounding assembly consists of a wire bolt (wire slot on one end and threaded post on the other), wire binding hex nut, and mounting hex washer nut. The grounding assembly is used with metal-framed photovoltaic (solar) panels and related products that require grounding for safety reasons.

Key Features - SOLARLOK Grounding Clip

- ▶ Product comes as an assembled kit that includes an attachment screw
- ▶ Contact design provides 4 points of contact to the ground wire for high reliability
- ▶ Product is easy to install with simple tools that are readily available
- ▶ Integral stamped housing feature cuts through the anodized aluminum surface when securing to the module
- ▶ Uninsulated solid copper wire 12-10 AWG
- ▶ For use with solar panels
- ▶ RoHS Compliant

Key Features - SOLARLOK Grounding Bolt

- ▶ Rugged and compact hex bolt design made from stainless steel
- ▶ Quick and easy mounting procedures
- ▶ Patented bottom edge feature cuts through the anodized aluminum surface when securing to the module frame
- ▶ No special tooling required to apply product
- ▶ Uninsulated solid copper wire 12-6 AWG
- ▶ Uninsulated stranded copper wire 10-6 AWG (7 or 19 strands)
- ▶ For use with solar panels

Standards and Specs

- ▶ SOLARLOK Grounding Clip - UL 467 approved, a requirement for UL 1703 solar panel listing
- ▶ SOLARLOK Grounding Bolt - UL 467 approved, a requirement for UL 1703 solar panel listing

Grounding System : Grounding Bolt

Technical Data

Materials

Connector & Hardware
: Stainless Steel (Passivated)

Electrical Features

Short Term Current Test (UL 467)

- : 6 AWG - 1530A (6 seconds)
- : 8 AWG - 1180A (4 seconds)
- : 10 AWG - 750A (4 seconds)
- : 12 AWG - 470A (4 seconds)

Mechanical Features

Securness Test (ul 486A-B)

- : 6 AWG - 18lbs (30 minutes)
- : 8 AWG - 8lbs (30 minutes)
- : 10 AWG - 5lbs (30 minutes)
- : 12 AWG - 5lbs (30 minutes)

Pull out Test (ul 486A-B)

- : 6 AWG - 100lbs (1 minute)
- : 8 AWG - 90lbs (1 minute)
- : 10 AWG - 80lbs (1 minute)
- : 12 AWG - 70lbs (1 minute)

Application Tooling

Flex socket wrench or wrenches

Standards

UL 467 listed

UL File #E69905

A requirement for UL 1703
solar panel listing

CSA C22.2 No. 41-07

Features & Benefits

- Rugged and compact hex bolt design made from stainless steel.
- Quick and easy mounting procedures.
- Bottom edge feature cuts through the anodized aluminum surface when securing the hex bolt to the module frame.
- Standard tooling can be used with the hex nuts.

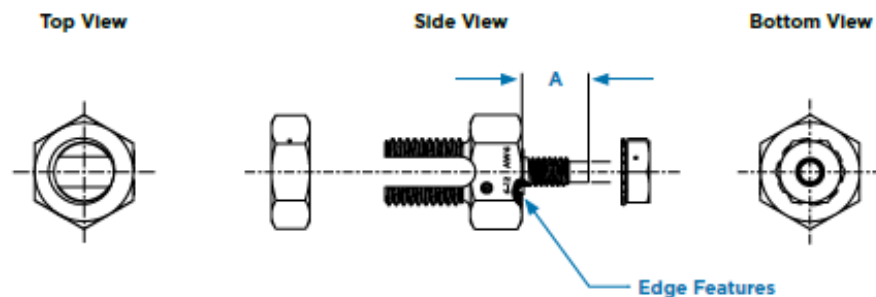


Product Offering

| Part Number | Description | Thread | Dim "A" | Package Quantity |
|-------------|---------------------|------------|---------|------------------|
| 2058729-1 | 6-12 AWG | #8-32 UNC | .380 | 100 |
| 2106831-1 | Long Shank 6-12 AWG | #10-32 UNF | .700 | 100 |

*Instruction Sheet : 408-10262

Dimensions



ERICO CADDY HAMMER-ON Z PURLIN CLIPS

[RELATED SECTION 26 05 29]

Model Number: 1238P

12312P

12316M

Location: underneath various trailers

Features:

1238P for 1/2" conduit

12312P for 3/4" conduit

12316M for 1" conduit

Approval Certificates:

UL Listed

Available: Lowes



Beam/Purlin

"Z" Purlin Clips

Features

- Hammer-on clip compensates for angle of purlin
- Provides method for attaching conduit and boxes to purlin



Fig. #1

| Part Number | Fig. # | Description | Standard Packaging Quantity |
|-------------|--------|---|-----------------------------|
| 122 | 1 | 1/4" hole to Z purlin | 100 |
| 123 | 2 | 1/4" bottom hole to Z purlin | 100 |
| 122708 | 3 | For #8 wire or 1/4" plain rod to Z purlin | 100 |
| 1226A | 3 | For 3/8" plain rod to Z purlin | 100 |
| 1224TI | 4 | For 1/4" threaded rod to Z purlin | 100 |
| 1226TI | 4 | For 3/8" threaded rod to Z purlin | 100 |
| 1226T | 4 | For 1/4" and 3/8" threaded rod to Z purlin, nuts required | 100 |
| 1236M | 5 | For 3/8" conduit to Z purlin | 100 |
| 123812M | 5 | For 1/2" to 3/4" conduit to Z purlin | 100 |
| 1238P* | 6 | For 1/2" conduit to Z purlin | 100 |
| 12312P* | 6 | For 3/4" conduit to Z purlin | 100 |
| 12316M | 5 | For 1" conduit to Z purlin | 100 |
| 12316P* | 6 | For 1" conduit to Z purlin | 50 |
| 12320M | 5 | For 1 1/4" conduit to Z purlin | 50 |

*When using rigid conduit on P series, use next size larger clip (1/2" Rigid use 12P).

Notes: Loads indicated are for CADDY® Fasteners only.

Purlin thickness 13 to 16 gage.

Static load limit 100 lbs except for P Series which is 25 lbs ultimate static load limit.



Fig. #5



Fig. #6



GAMPAK ELECTRICAL METALLIC TUBING [EMT] STEEL STRAPS

[RELATED SECTION 26 05 29]

Model Number: 47830

47920

Location: underneath various trailers

Features:

47830 for 1/2" EMT with 2 hole strap

47920 for 1/2" EMT with 1 hole strap

Approval Certificates:

UL Listed

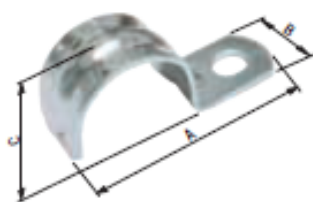
CSA Listed

Available: Consolidated Electrical Distribution



Rigid One Hole Straps

Correas Rígidas De Un Agujero

**Use:**

One hole straps are used for providing support for Rigid or IMC Conduit as required by the National Electrical Code.

- Click-On Type

Uso:

Las abrazaderas con un agujero se utilizan para brindar soporte a los conductos IMC o rígidos según lo requiere el Código Eléctrico Nacional.

- Tacleo-En Tipo

Materials / Materiales :

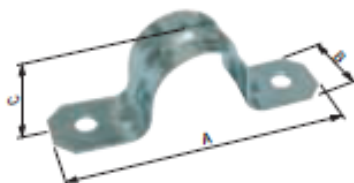
- Stamped Steel / Acero Estampado

Finish / Final :

- Zinc Plated / El Cinc Plateó

Rigid Two Hole Straps

Dos Correas Rígidas Del Agujero

**Use:**

Two hole straps are used for providing support for Rigid or IMC Conduit as required by the National Electrical Code where higher load bearing supports are desired.

- Click-On Type

Uso:

Las abrazaderas con dos agujeros se utilizan para brindar soporte a los conductos IMC o rígidos, los cuales son necesarios para soportar cargas más pesadas, según lo requiere el Código Eléctrico Nacional.

- Tacleo-En Tipo

Materials / Materiales :

- Stamped Steel / Acero Estampado

Finish / Final :

- Zinc Plated / El Cinc Plateó

Certification / Certificación :

UL E229278

Standards / Estándares :

UL 2239

CSA C22.2 No. 18

NEC Article 345 & 346

RIGID CONDUIT

| Catalog Number | UPC No 0-31857 | Trade Size | Nominal Dimensions | | | Pcs/ Unit | Ctn/Case Qty/Qty | Case Wt. |
|----------------|----------------|------------|--------------------|------|------|-----------|------------------|----------|
| | | | A | B | C | | | |
| Polybag | | | | | | | | |
| 45900 | 45900-0 | 1/2" | 1.85 | 0.62 | 0.90 | 25 | 20 | 17.8 |
| 47900 | 47900-8 | 1/2" | 1.85 | 0.62 | 0.90 | 3 | 25 | 3.0 |
| 49900 | 49900-6 | 1/2" | 1.85 | 0.62 | 0.90 | 4 | 25 | 3.9 |
| 45901 | 45901-7 | 3/4" | 2.20 | 0.75 | 1.13 | 20 | 20 | 22.0 |
| 49901 | 49901-3 | 3/4" | 2.20 | 0.75 | 1.13 | 3 | 20 | 3.6 |
| 49902 | 49902-0 | 1" | 2.60 | 0.88 | 1.32 | 1 | 20 | 1.9 |
| 44903 | 44903-2 | 1 1/4" | 2.95 | 0.88 | 1.64 | 4 | 20 | 11.2 |
| 49903 | 49903-7 | 1 1/4" | 2.95 | 0.88 | 1.64 | 1 | 25 | 3.7 |
| 44904 | 44904-9 | 1 1/2" | 3.62 | 1.02 | 1.90 | 2 | 20 | 7.4 |
| 49904 | 49904-4 | 1 1/2" | 3.62 | 1.02 | 1.90 | 1 | 25 | 4.7 |
| 44905 | 44905-6 | 2" | 4.09 | 1.14 | 2.32 | 2 | 20 | 10.7 |
| Boxed | | | | | | | | |
| 1801 | 65900-4 | 1/2" | 1.85 | 0.62 | 0.90 | - | 50/250 | 9.8 |
| 55900-S | 55900-7 | 1/2" | 1.85 | 0.62 | 0.90 | - | 50/500 | 19.5 |
| 1802 | 65901-1 | 3/4" | 2.20 | 0.75 | 1.13 | - | 25/125 | 7.6 |
| 55901-S | 55901-4 | 3/4" | 2.20 | 0.75 | 1.13 | - | 50/500 | 31.4 |
| 1803 | 65902-8 | 1" | 2.60 | 0.88 | 1.32 | - | 20/100 | 10.0 |
| 55902-S | 55902-1 | 1" | 2.60 | 0.88 | 1.32 | - | 50/500 | 45.1 |
| 55903-S | 55903-8 | 1 1/4" | 2.95 | 0.88 | 1.64 | - | 25/250 | 31.8 |
| 55904-S | 55904-5 | 1 1/2" | 3.62 | 1.02 | 1.90 | - | 25/250 | 43.3 |
| 55905-S | 55905-2 | 2" | 4.09 | 1.14 | 2.32 | - | 25 | 6.7 |
| 55906-S | 55906-9 | 2 1/2" | 4.90 | 1.25 | 3.00 | - | 25 | 12.2 |
| 55907-S | 55907-6 | 3" | 5.53 | 1.25 | 3.60 | - | 25 | 13.3 |
| 55908-S | 55908-3 | 3 1/2" | 6.18 | 1.25 | 4.13 | - | 25 | 17.5 |
| 55909-S | 55909-0 | 4" | 6.68 | 1.25 | 4.63 | - | 25 | 16.0 |

RIGID CONDUIT

| Catalog Number | UPC No 0-31857 | Trade Size | Nominal Dimensions | | | Pcs/ Unit | Ctn/Case Qty/Qty | Case Wt. |
|----------------|----------------|------------|--------------------|------|------|-----------|------------------|----------|
| | | | A | B | C | | | |
| Polybag | | | | | | | | |
| 44830 | 44830-1 | 1/2" | 2.48 | 0.62 | 0.87 | 10 | 20 | 5.2 |
| 47830 | 47830-8 | 1/2" | 2.48 | 0.62 | 0.87 | 3 | 25 | 2.2 |
| 49830 | 49830-6 | 1/2" | 2.48 | 0.62 | 0.87 | 4 | 25 | 2.7 |
| 44831 | 44831-8 | 3/4" | 2.91 | 0.69 | 0.98 | 10 | 20 | 6.5 |
| 49831 | 49831-3 | 3/4" | 2.91 | 0.69 | 0.98 | 3 | 20 | 2.2 |
| 47831 | 47831-5 | 3/4" | 2.91 | 0.69 | 0.98 | 4 | 20 | 2.8 |
| 49832 | 49832-0 | 1" | 3.36 | 0.75 | 1.30 | 1 | 20 | 1.4 |
| 49833 | 49833-7 | 1 1/4" | 4.09 | 0.88 | 1.61 | 1 | 20 | 2.1 |
| 44833 | 44833-2 | 1 1/4" | 4.09 | 0.88 | 1.61 | 4 | 20 | 6.5 |
| 49834 | 49834-4 | 1 1/2" | 4.40 | 0.94 | 1.90 | 1 | 20 | 2.8 |
| 44834 | 44834-9 | 1 1/2" | 4.40 | 0.94 | 1.90 | 2 | 20 | 5.0 |
| 44835 | 44835-6 | 2" | 5.11 | 1 | 2.30 | 2 | 15 | 4.6 |
| 49835 | 49835-1 | 2" | 5.11 | 1 | 2.30 | 1 | 20 | 3.3 |
| Boxed | | | | | | | | |
| 51901 | 51901-8 | 1/2" | 2.48 | 0.62 | 0.87 | - | 50/500 | 13.7 |
| 51902 | 51902-5 | 3/4" | 2.91 | 0.69 | 0.98 | - | 50/500 | 17.1 |
| 51903 | 51903-2 | 1" | 3.36 | 0.75 | 1.30 | - | 25/250 | 15.9 |
| 51904 | 51904-9 | 1 1/4" | 4.09 | 0.88 | 1.61 | - | 50 | 4.1 |
| 51905 | 51905-6 | 1 1/2" | 4.40 | 0.94 | 1.90 | - | 50 | 5.7 |
| 51906 | 51906-3 | 2" | 5.11 | 1 | 2.30 | - | 50 | 7.4 |
| 51907 | 51907-0 | 2 1/2" | 5.88 | 1.00 | 2.91 | - | 25 | 5.6 |
| 51908 | 51908-7 | 3" | 6.50 | 1.0 | 3.53 | - | 25 | 6.5 |
| 51909 | 51909-4 | 3 1/2" | 7.38 | 1 | 4.03 | - | 25 | 9.0 |
| 51910 | 51910-0 | 4" | 8.00 | 1 | 4.53 | - | 25 | 9.8 |

1/2" ELECTRICAL METALLIC TUBING [EMT]

[RELATED SECTION 26 05 33.13]

Model Number: 101534

Location: underneath various trailers

Dimensions:

Diameter: 1/2"

Length: 10'

Finish: galvanized steel

Features:

Internal diameter: 0.622"

Wall thickness: 0.042"

Approval Certificates:

UL Listed

CSA Listed

Available: Lowes

Price: \$2.00





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1/2" x 10 Ft. Electrical Metallic Tube EMT Conduit

Item #: 72711 | Model #:101543

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\$2.00

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3/4" x 10' Electric Metallic Tube (EMT)...

★★★★★
\$4.00



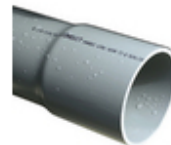
1" x 10' Electrical Metallic Tubing (EMT)...

★★★★★
\$6.90



Gampak 1/2" EMT Steel
Not Yet Rated

\$0.76



JM Eagle 1/2" PVC 10'L Conduit
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\$1.20



1-1/4" x 10' Electrical Metallic Tube (EMT)...

Not Yet Rated
\$10.79

[Description](#)

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Trade Size in Inches

1/2

Conduit Wall Thickness

N/A

Commercial Grade

No

Color/Finish Family

Metallic

UL Safety Listing

Yes

Material

Metallic

CSA Safety Listing

Yes

Threaded

No

ETL Safety Listing

No

Thin-Walled

No

Electrical Conduit Type

EMT

Galvanized

Yes

Length (Feet)

10.0

3/4" ELECTRICAL METALLIC TUBING [EMT]

[RELATED SECTION 26 05 33.13]

Model Number: 101550

Location: underneath various trailers

Dimensions:

Diameter: 3/4"

Length: 10'

Finish: galvanized steel

Features:

Internal diameter: 0.824"

Wall thickness: 0.049"

Approval Certificates:

UL Listed

CSA Listed

Available: Lowes

Price: \$4.00





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3/4" x 10' Electric Metallic Tube (EMT) Conduit

Item #: 72713 | Model #:101550

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\$4.00

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1/2" x 10 Ft. Electrical Metallic Tube EMT...

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1" x 10' Electrical Metallic Tubing (EMT)...

★★★★★

\$6.90



Gampak 3/4" EMT Die Cast Zinc

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3/4" x 10 Ft. Galvanized Rigid (GRC) Conduit

Not Yet Rated

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1-1/4" x 10' Electrical Metallic Tube (EMT)...

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\$10.79

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Trade Size in Inches

3/4

Commercial Grade

No

UL Safety Listing

Yes

CSA Safety Listing

Yes

ETL Safety Listing

No

Electrical Conduit Type

EMT

Length (Feet)

10.0

Conduit Wall Thickness

N/A

Color/Finish Family

Metallic

Material

Metallic

Threaded

No

Thin-Walled

No

Galvanized

Yes

1" ELECTRICAL METALLIC TUBING [EMT]

[RELATED SECTION 26 05 33.13]

Model Number: 101568

Location: underneath various trailers

Dimensions:

Diameter: 1"

Length: 10'

Finish: galvanized steel

Features:

Internal diameter: 1.149"

Wall thickness: 0.057"

Approval Certificates:

UL Listed

CSA Listed

Available: Lowes

Price: \$6.90





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1" x 10' Electrical Metallic Tubing (EMT) Conduit

Item #: 72715 | Model #:101568

★★★★★ [1 review](#) | [Write a review](#)

\$6.90

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Not Yet Rated
\$2.00



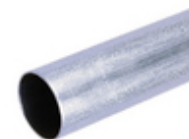
1-1/4" x 10' Electrical Metallic Tube (EMT)...

Not Yet Rated
\$10.79



1-1/2" x 10' Electrical Metallic (EMT)...

Not Yet Rated
\$13.80



2" x 10' Electrical Metallic (EMT) Conduit

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\$16.40

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| | | | |
|-------------------------|------|------------------------|----------|
| Trade Size in Inches | 1 | Conduit Wall Thickness | N/A |
| Commercial Grade | No | Color/Finish Family | Metallic |
| UL Safety Listing | Yes | Material | Metallic |
| CSA Safety Listing | Yes | Threaded | No |
| ETL Safety Listing | No | Thin-Walled | No |
| Electrical Conduit Type | EMT | Galvanized | Yes |
| Length (Feet) | 10.0 | | |

SOUTHWIRE LIQUIDTIGHT FLEXIBLE METAL CONDUIT [LFMC]

[RELATED SECTION 26 05 33.13]

Model Number: 55082721

Location: underneath various trailers

Dimensions:

Diameter: 3/4"

Length: 25'

Finish: construction steel

Features:

Internal diameter: 0.380"

Approval Certificates:

UL Listed

CSA Listed

Available: Lowes

Price: \$37.18





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Conduit



Southwire 3/4" x 25' Flex Conduit

Item #: 69856 | Model #:55082721

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\$37.18

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Southwire 25 Ft. 1/2" Non-Metallic...
Not Yet Rated
\$28.33



Southwire 1/2 In. X 25 Ft. Coil Flexible...
Not Yet Rated
\$13.58



Southwire 25 Ft. Coil Reduced Wall Flexible...
Not Yet Rated
\$15.74

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| | | | |
|-------------------------|------|------------------------|----------|
| Trade Size in Inches | 3/4 | Conduit Wall Thickness | N/A |
| Commercial Grade | Yes | Color/Finish Family | Metallic |
| UL Safety Listing | Yes | Material | Metallic |
| CSA Safety Listing | Yes | Threaded | Yes |
| ETL Safety Listing | No | Thin-Walled | No |
| Electrical Conduit Type | Flex | Galvanized | No |
| Length (Feet) | 25.0 | | |

TE SOLARLOK COMBINER BOX

[RELATED SECTION 26 05 33.16]

Model Number: 408-10271

Location: Outdoor Kitchen Mechanical Closet

Features:

Maximum fuse rating [DC]: 15 A

Fuse size: 13/32" x 1-1/2" [10 mm x 38 mm]

Weatherability enclosure type: NEMA Type 3

Maximum Ambient Temperature: 50°C

Electrical:

Maximum system voltage [DC]: 600 V

Maximum output current [DC]: 75 A

Maximum input voltage [DC]: 600 V

Maximum input current [DC]: 15 A

Maximum continuous current [DC]: 60 A

Maximum current per string [DC]: 15 A

Approval Certificates:

UL Listed

Available: TTI





Combiner Box Assembly Overview



SOLARLOK 5-string Combiner Box for residential use to combine up to five strings in a pre-terminated connectorized weather-resistant enclosure to meet National Electric Code (NEC) requirements for series fusing of photovoltaic (PV) modules (solar panels).

The SOLARLOK 5-string Combiner Box for residential use consists of a box, cover (with hinges), transparent dead front lid (under the cover), and 10 pre-terminated male SOLARLOK connectors each with a removeable seal cover. The box features 4 knockouts (for output wiring), lock tab, mounting slots, and pre-wired grounding clip.

The interior of the box holds 5 fuse blocks pre-wired to the positive SOLARLOK connectors, 5 terminal blocks pre-wired to the negative SOLARLOK connectors, and an equipment terminal block used to ground the equipment. Fuses are not included.



Key Features

- › Combines up to 5 PV strings and converts to standard THWN-2 wire (single string) in conduit
- › Completely pre-assembled
- › 10 pre-terminated SOLARLOK pin (male) connectors
- › NEMA3 box is IP65 Rated
- › Plug and play design provides labor savings and minimizes installer error during installation

Applications

- › SOLARLOK connectors
- › SOLARLOK grounding solution
- › SOLARLOK ground bolt

[View SOLARLOK 5-string Combiner Box Video](#)

[View SOLARLOK 5-string Combiner Box Installation Video](#)

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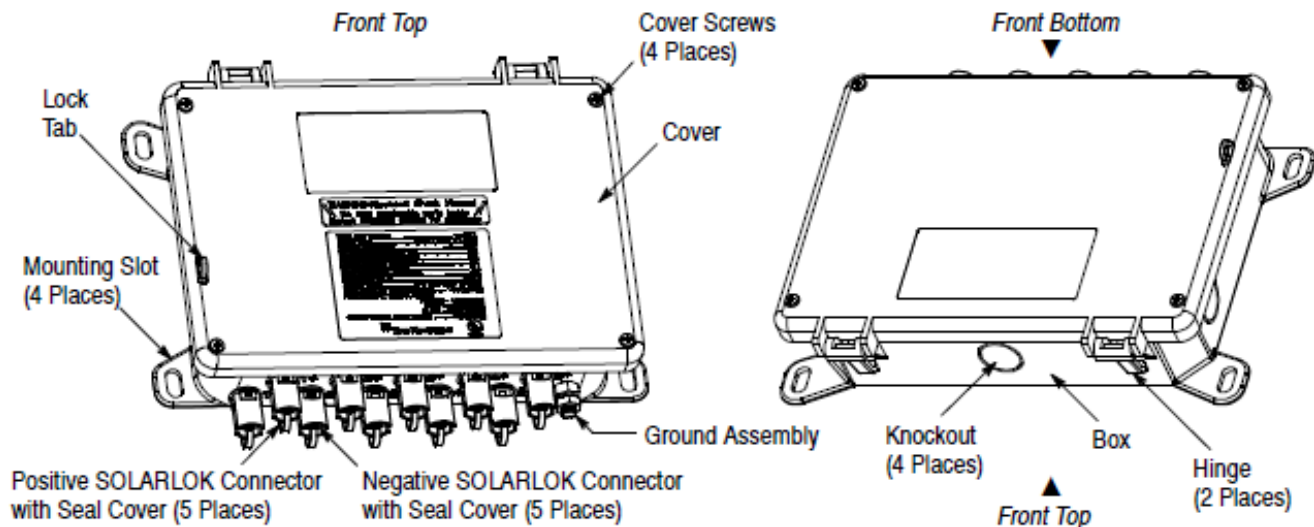


Figure 1

1. INTRODUCTION

SOLARLOK Combiner Box Assemblies 1954283-1 and 1954283-2 are used to combine up to five strings in a pre-terminated connectorized weather-resistant enclosure to meet National Electric Code (NEC) requirements for series fusing of photovoltaic (PV) modules.

NOTE



All numerical values in this instruction sheet are in metric units [with U.S. customary units in brackets]. Figures are not drawn to scale.

Combiner Box Assembly Specifications

| | |
|---|----------------------|
| System Voltage (DC): | 600 V Maximum |
| Output Current (DC): | 75 A Maximum |
| Continuous Current (DC): | 60 A Maximum |
| Current Per String (DC): | 15 A Maximum |
| Accepts Fuse Rating (DC): | 15 A Maximum |
| Module Short Circuit Rating (Isc) Per String: | 9.6 A Maximum |
| Weatherability Enclosure Type: | NEMA Type 3 |
| Ambient Temperature: | 50°C [122°F] Maximum |
| Torque: | |
| Negative Output Terminal | 4 Nm [35 in.-lbs] |
| Positive Output Terminal | |
| Wire Sizes 14-10 AWG | 4 Nm [35 in.-lbs] |
| Wire Size 8 AWG | 4.5 Nm [40 in.-lbs] |
| Wire Sizes 6-4 AWG | 5.1 Nm [45 in.-lbs] |
| Ground Terminal Block | 4 Nm [35 in.-lbs] |

NEMA, National Electrical Code, and NEC are trademarks of their respective owners.

The combiner box assemblies meet the standards of Underwriters Laboratories Inc. (UL) 1741 to be used as an accessory for inverters.

Reasons for reissue of this instruction sheet are provided in Section 5, REVISION SUMMARY.

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

This instruction sheet contains important instructions for Assemblies 1954283-1 and 1954283-2 that must be followed during installation and maintenance of the power system.

Read and understand the following safety precautions *before* installing or working with the combiner box assembly.

— Wiring methods must comply with the National Electric Code (NEC) and American National Standards Institute (ANSI)/National Fire Protection Association (NFPA).

— The DC input and DC output circuits are isolated from the enclosure. System grounding, if required by Section 250 of the NEC and ANSI/NFPA 70, is the responsibility of the installer.

— The photovoltaic system grounding must be installed according to the requirements of Sections 690.41 through 690.47 of the NEC, ANSI/NFPA 70, and is the responsibility of the installer.

— **DO NOT** work with the combiner box assembly if it is attached to any live electrical source.

AUSTIN ELECTRICAL JUNCTION AND PULL BOX

[RELATED SECTION 26 05 33.16]

Model Number: AB-444SB

Location: underneath each trailer

Dimensions:

Length: 4"

Width: 4"

Height: 4"

Finish: galvanized steel

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution

Price:



TYPE 1 SCREW COVER BOXES

Austin screw cover boxes are Underwriters Laboratories Listed for Junction and Pull box applications. All screw cover boxes meet the general-purpose indoor requirements.

Construction:

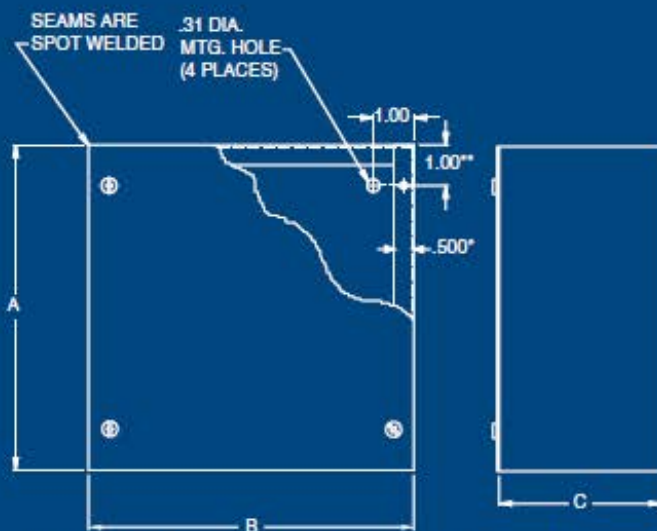
- Fabricated in accordance with UL specifications from code gauge steel.
- Boxes are furnished with or without knockouts. If knockouts are requested, a combination of 1/2 - 3/4" and 3/4 - 1" standard conduit sizes are furnished.
- Boxes under 48" x 36" have 5/16" mounted holes.
- Boxes 48" x 36" and over have 7/16" mounted holes.

Finish:

Austin screw cover boxes are constructed standard in galvanized steel. An ANSI 61 gray polyester powder coating over CRS is available on request.

Options:

- Special knockouts or knockout arrangements.
- Special materials.
- Special finishes.
- Custom box size or construction.



*THIS DIMENSION IS .750 WHEN "A" AND "B" ARE 24 x 24 AND OVER

**THIS DIMENSION IS 1.250 WHEN "A" AND "B" ARE 24 x 24 AND OVER



**INDUSTRY
STANDARDS**

UL 50 Type 1
NEMA Type 1
CUL Type 1

Austin Electrical Enclosures
Post Office Box 2320
Yadkinville, NC 27055

Phone: 336.468.2851
800.288.2851

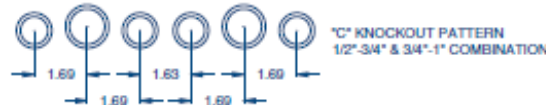
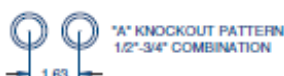
SCREW COVER BOXES

| Catalog Number | Bundle Quantity | Bundle Weight | Enclosure Size (AxBxC) | Knockout Pattern Sides "A" | Knockout Pattern Sides "B" | Catalog Number | Bundle Quantity | Bundle Weight | Enclosure Size (AxBxC) | Knockout Pattern (A) Sides "A" | Knockout Pattern (B) Sides "B" |
|----------------|-----------------|---------------|------------------------|----------------------------|----------------------------|----------------|-----------------|---------------|------------------------|--------------------------------|--------------------------------|
| AB-444SB | 5 | 10 | 4x4x4 | A | A | AB-48366SB | 1 | 140.5 | 48x36x6 | NA | NA |
| AB-644SB | 5 | 10 | 6x4x4 | B | B | AB-48486SB | 1 | 206 | 48x48x6 | NA | NA |
| AB-664SB | 5 | 15 | 6x6x4 | B | B | | | | | | |
| AB-864SB | 5 | 20 | 8x6x4 | B | B | AB-888SB | 1 | 7 | 8x8x8 | B | B |
| AB-1064SB | 5 | 22.5 | 10x6x4 | B | B | AB-10108SB | 1 | 9.5 | 10x10x8 | B | B |
| AB-1264SB | 5 | 25 | 12x6x4 | C | B | AB-12128SB | 1 | 12 | 12x12x8 | C | C |
| AB-884SB | 5 | 25 | 8x8x4 | B | B | AB-15128SB | 1 | 15 | 15x12x8 | C | C |
| AB-1084SB | 5 | 25 | 10x8x4 | B | B | AB-18128SB | 1 | 17 | 18x12x8 | D | C |
| AB-1284SB | 5 | 32.5 | 12x8x4 | C | B | AB-24128SB | 1 | 21 | 24x12x8 | D | C |
| AB-10104SB | 5 | 35 | 10x10x4 | B | B | AB-15158SB | 1 | 17 | 15x15x8 | C | C |
| AB-12104SB | 5 | 40 | 12x10x4 | C | B | AB-18158SB | 1 | 20 | 18x15x8 | D | C |
| AB-12124SB | 5 | 45 | 12x12x4 | C | C | AB-18188SB | 1 | 22.5 | 18x18x8 | D | D |
| AB-15124SB | 1 | 11 | 15x12x4 | C | C | AB-24188SB | 1 | 28 | 24x18x8 | D | D |
| AB-18124SB | 1 | 13 | 18x12x4 | D | C | AB-24248SB | 1 | 39.5 | 24x24x8 | D | D |
| AB-24124SB | 1 | 15 | 24x12x4 | D | C | AB-30248SB | 1 | 47.5 | 30x24x8 | D | D |
| AB-15154SB | 1 | 14 | 15x15x4 | C | C | AB-36248SB | 1 | 61 | 36x24x8 | D | D |
| AB-18154SB | 1 | 16 | 18x15x4 | D | C | AB-48248SB | 1 | 79 | 48x24x8 | D | D |
| AB-18184SB | 1 | 17 | 18x18x4 | D | D | AB-30308SB | 1 | 75 | 30x30x8 | NA | NA |
| AB-24184SB | 1 | 23 | 24x18x4 | D | D | AB-36308SB | 1 | 87 | 36x30x8 | NA | NA |
| AB-24244SB | 1 | 35 | 24x24x4 | D | D | AB-36368SB | 1 | 101.5 | 36x36x8 | NA | NA |
| AB-30244SB | 1 | 43 | 30x24x4 | D | D | AB-48368SB | 1 | 151 | 48x36x8 | NA | NA |
| AB-36244SB | 1 | 51 | 36x24x4 | D | D | AB-48488SB | 1 | 220 | 48x48x8 | NA | NA |
| AB-666SB | 5 | 20 | 6x6x6 | B | B | AB-121210SB | 1 | 14 | 12x12x10 | C | C |
| AB-866SB | 5 | 25 | 8x6x6 | B | B | AB-181210SB | 1 | 19 | 18x12x10 | D | C |
| AB-1266SB | 5 | 35 | 12x6x6 | C | B | AB-181810SB | 1 | 25 | 18x18x10 | D | D |
| AB-886SB | 5 | 30 | 8x8x6 | B | B | AB-241810SB | 1 | 31.5 | 24x18x10 | D | D |
| AB-1086SB | 5 | 35 | 10x8x6 | B | B | AB-242410SB | 1 | 43.5 | 24x24x10 | D | D |
| AB-1286SB | 5 | 40 | 12x8x6 | C | B | AB-362410SB | 1 | 67 | 36x24x10 | D | D |
| AB-10106SB | 5 | 45 | 10x10x6 | B | B | AB-303010SB | 1 | 81 | 30x30x10 | NA | NA |
| AB-12106SB | 5 | 45 | 12x10x6 | C | B | AB-363010SB | 1 | 94 | 36x30x10 | NA | NA |
| AB-12126SB | 5 | 55 | 12x12x6 | C | C | AB-363610SB | 1 | 109 | 36x36x10 | NA | NA |
| AB-15126SB | 1 | 13 | 15x12x6 | C | C | AB-483610SB | 1 | 161.5 | 48x36x10 | NA | NA |
| AB-18126SB | 1 | 15 | 18x12x6 | D | C | AB-484810SB | 1 | 234 | 48x48x10 | NA | NA |
| AB-24126SB | 1 | 21 | 24x12x6 | D | C | | | | | | |
| AB-15156SB | 1 | 16 | 15x15x6 | C | C | AB-121212SB | 1 | 16 | 12x12x12 | C | C |
| AB-18156SB | 1 | 17 | 18x15x6 | D | C | AB-181212SB | 1 | 21 | 18x12x12 | D | C |
| AB-18186SB | 1 | 20 | 18x18x6 | D | D | AB-241212SB | 1 | 26.5 | 24x12x12 | D | C |
| AB-24186SB | 1 | 25 | 24x18x6 | D | D | AB-181812SB | 1 | 28 | 18x18x12 | D | D |
| AB-24246SB | 1 | 36 | 24x24x6 | D | D | AB-241812SB | 1 | 34.5 | 24x18x12 | D | D |
| AB-30246SB | 1 | 43 | 30x24x6 | D | D | AB-242412SB | 1 | 47.5 | 24x24x12 | D | D |
| AB-36246SB | 1 | 56 | 36x24x6 | D | D | AB-362412SB | 1 | 72 | 36x24x12 | D | D |
| AB-48246SB | 1 | 72 | 48x24x6 | D | D | AB-303012SB | 1 | 88 | 30x30x12 | NA | NA |
| AB-30306SB | 1 | 68 | 30x30x6 | NA | NA | AB-363612SB | 1 | 117 | 36x36x12 | NA | NA |
| AB-36306SB | 1 | 80 | 36x30x6 | NA | NA | AB-483612SB | 1 | 172 | 48x36x12 | NA | NA |
| AB-36366SB | 1 | 94 | 36x36x6 | NA | NA | AB-484812SB | 1 | 247.5 | 48x48x12 | NA | NA |

NOTE:

Replace "SB" Suffix with: SBK: Screw Cover w/KO's
 SBGK: Screw Cover Gray w/KO's
 SBG: Screw Cover Gray

POSSIBLE KNOCKOUT PATTERNS



NOTE: REFER TO BOX TABLE FOR APPLICABLE KNOCKOUT PATTERN

CANTEX RIGID PVC JUNCTION BOX

[RELATED SECTION 26 05 33.16]

Model Number: CTX-5133710

Location: underneath the Great Porch

Dimensions:

Length: 6"

Width: 6"

Height: 4"

Weight: 2.6 lbs

Features:

Weather tight

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution



Round Junction Box



| PART NO. | SIZE | STD. PKG. | UPC-ITF 3 00 88700 | PKG. WT. |
|----------|-----------|-----------|-----------------------|----------|
| 5133690 | 1/2 & 3/4 | 15 | 56793 2 | 12.97 |

Junction Boxes



| PART NO. | SIZE | STD. PKG. | UPC-ITF 3 00 88700 | PKG. WT. |
|-----------|---------|-----------|-----------------------|----------|
| *5133705 | 4x4x2 | 10 | 51790 6 | 8.14 |
| *5133709 | 4x4x4 | 10 | 51794 4 | 10.57 |
| 5133707 | 4x4x6 | 10 | 51792 0 | 15.00 |
| 5133706 | 5x5x2 | 10 | 51791 3 | 10.82 |
| *5133710 | 6x6x4 | 10 | 51795 1 | 20.79 |
| *5133711 | 6x6x6 | 5 | 51796 8 | 11.69 |
| *5133712 | 8x8x4 | 5 | 51797 5 | 16.46 |
| *5133164 | 8x8x6 | 4 | 51719 7 | 15.30 |
| 5133708 | 8x8x7 | 4 | 51793 7 | 20.93 |
| 5133714 | 12x12x4 | 2 | 51799 9 | 14.93 |
| *5133713 | 12x12x6 | 2 | 51798 2 | 15.91 |
| **5133163 | 16x14x6 | 1 | 51718 0 | 11.94 |
| • 5133165 | 24x18x8 | 1 | 51720 3 | 20.00 |
| • 5133166 | 24x24x8 | 1 | 51721 0 | 24.50 |
| • 5133173 | 36x24x8 | 1 | 54758 3 | 45.00 |

* CSA Listed

** UL Listed with only a Type 1 NEMA Rating

• Not UL Listed

Duplex Boxes and Cover



| PART NO. | SIZE / DESCRIPTION | STD. PKG. | UPC-ITF 3 00 88700 | PKG. WT. |
|----------|--|-----------|-----------------------|----------|
| 5133760 | Floor Box Base 4-3/4" Hubs, 4-3/4" to 1/2" Reducers, Level Ring & Pour Cover, U.L. Listed | 9 | 56927 1 | 16.67 |
| 5133758 | Floor Box Base 2-3/4" Hubs, 2-1" Hubs, 2-3/4" to 1/2" Reducers, 2-1" to 3/4" Reducers, Level Ring and Pour Cover. U.L. Listed | 9 | 56926 4 | 16.67 |
| 5133678 | Duplex Cover-BRONZE | 10 | 51768 5 | 4.38 |

CARLON JUNCTION BOX

[RELATED SECTION 26 05 33.16]

Model Number: E989NL

Location: Flex Bath

Dimensions:

Length: 8"

Width: 8"

Height: 4"

Features:

Conduit fitting material: PVC

Conduit fitting type: transition

Approval Certificates:

UL Listed

ETL Listed

Available: Lowes

Price: \$20.59





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[CARLON 8" x 8" x 4" Junction Box](#)



CARLON 8" x 8" x 4" Junction Box

Item #: 145145 | Model #:E989NL

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\$20.59

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[CANTEX Plastic New Junction Box](#)



[CARLON 6" x 6" x 4" Junction Box](#)



[CARLON 12" x 12" x 4" Junction Box](#)



[CARLON 4" x 4" x 2" Junction Box](#)



[CARLON 4" x 4" x 4" Junction Box](#)

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| | | | |
|---------------------------|------------|--------------------|-----|
| Conduit Fitting Material | PVC | Application Type | PVC |
| Conduit Fitting Type | Transition | UL Safety Listing | Yes |
| Trade Size in Inches | 4" | CSA Safety Listing | Yes |
| Conduit Fitting Thickness | N/A | ETL Safety Listing | No |
| Package Contents | 1 | | |

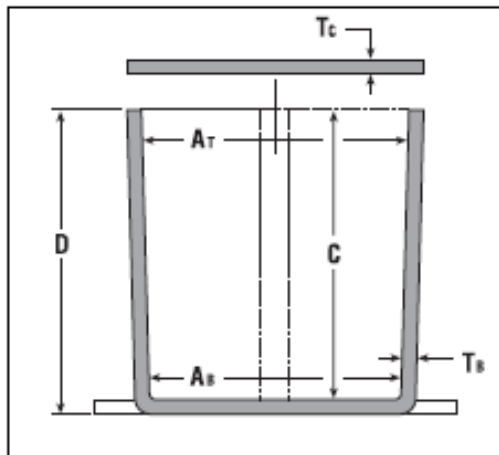
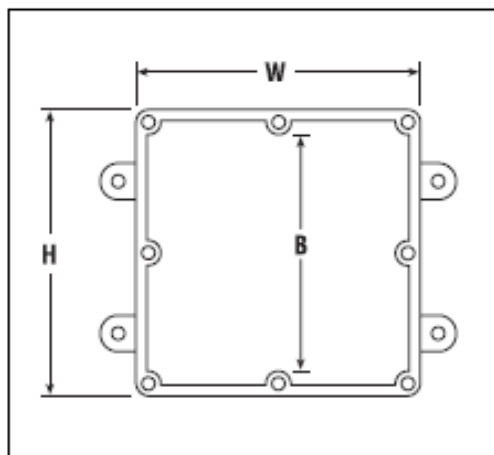
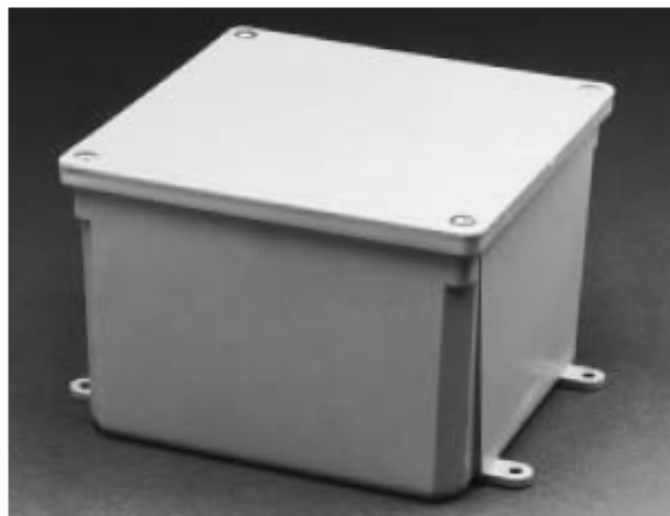
Molded Nonmetallic Junction Boxes 6P Rated

 Except where noted by †


LISTED
E42728

It's another first from Carlon® - the first nonmetallic junction boxes UL Listed with a NEMA 6P rating per Section 314.29, Exception of the National Electrical Code. Manufactured from PVC or PPO thermoplastic molding compound and featuring foam-in-place gasketed lids attached with stainless steel screws, these rugged enclosures offer all the corrosion resistance and physical properties you need for direct burial applications.

Type 6P enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against contact with enclosed equipment, falling dirt, hose-directed water, entry of water during prolonged submersion at a limited depth, and external ice formation.



- All Carlon Junction Boxes are UL Listed and maintain a minimum of a NEMA Type 4/4x Rating.
- Parts numbers with an asterisk (*) are UL Listed and maintain a NEMA Type 6P Rating and Type 4/4X Rating.

| Part No. | Size in Inches H x W x D | Std. Ctn. Qty. | Min. A _T | Min. A _B | Min. B | Min. C | T _a | T _c Typical | Material | | Std. Ctn. Wt. (Lbs.) |
|---------------|-----------------------------|----------------|----------------------------------|--------------------------------|---------------------------------|--------|----------------|---------------------------|----------|----------------|----------------------|
| | | | | | | | | | PVC | Thermo-plastic | |
| E989NNJ-CAR* | 4 x 4 x 2 | 5 | 3 ¹¹ / ₁₆ | 3 ⁵ / ₈ | N/A | 2 | .160 | .155 | X | | 3 |
| E987N-CAR* | 4 x 4 x 4 | 5 | 3 ¹¹ / ₁₆ | 3 ¹ / ₂ | N/A | 4 | .160 | .155 | X | | 4 |
| †E989NNR-CAR* | 4 x 4 x 6 | 4 | 3 ¹¹ / ₁₆ | 3 ³ / ₈ | N/A | 6 | .160 | .200 | X | | 5 |
| E989PPJ-CAR* | 5 x 5 x 2 | 4 | 4 ¹¹ / ₁₆ | 4 ¹ / ₂ | N/A | 2 | .110 | .150 | | X | 3 |
| E987R-CAR* | 6 x 6 x 4 | 2 | 6 | 5 ⁵ / ₈ | N/A | 4 | .190 | .190 | | X | 3 |
| E989RRR-UPC* | 6 x 6 x 6 | 8 | 5 ⁵ / ₈ | 5 ³ / ₈ | N/A | 6 | .160 | .150 | | X | 14 |
| E989N-CAR | 8 x 8 x 4 | 1 | 8 | 8 | N/A | 4 | .185 | .190 | | X | 2 |
| E989SSX-UPC | 8 x 8 x 7 | 2 | 7 ²¹ / ₃₂ | 7 ⁵ / ₁₆ | N/A | 7 | .160 | .150 | | X | 6 |
| E989UUN | 12 x 12 x 4 | 3 | 11 ⁵ / ₈ | 11 ¹ / ₂ | 11 ¹ / ₈ | 4 | .160 | .150 | | X | 12 |
| E989R-UPC | 12 x 12 x 6 | 2 | 11 ¹⁵ / ₁₆ | 11 ⁷ / ₈ | 11 ⁷ / ₁₆ | 6 | .265 | .185 | | X | 10 |

ALLIED MOULDED SINGLE GANG RECEPTACLE BOX

[RELATED SECTION 26 05 33.16]

Model Number: 1099-N

Location: throughout The Solar Homestead

Dimensions:

Width: 2-1/4"

Height: 3-3/4"

Depth: 3-9/16"

Finish: thermoset-fiberglass

Features:

Volume: 22.5 in³

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution



Single Gang

Residential Switch or Receptacle Box



Series Nail-On



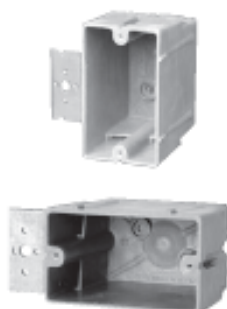
| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|-------------------------------------|--|--------|-------|-------|----------------|----------------|---------------------|
| 18.0 | 1096-N | Internal mid-nails | 3 | 2-1/4 | 3-3/4 | 24414 | 100 | 31 |
| 20.5 | 1098-N | Angled mid-nails | 3-1/4 | 2-1/4 | 3-3/4 | 25001 | 100 | 35 |
| 22.5 | 1099-N* (Top photo) 1099-NRED | Angled mid-nails Same as 1099-N but molded in red for fire circuits | 3-9/16 | 2-1/4 | 3-3/4 | 26000 96500 | 100 24 | 37 9 |

Series Steel Stud Screws



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|--------|-------|-------|------------|----------------|---------------------|
| 18.0 | 1096-SS | Steel stud screws for use with non-load bearing studs 22 gauge or lighter | 3 | 2-1/4 | 3-3/4 | 24421 | 100 | 32 |
| 20.5 | 1098-SS | Steel stud screws for use with non-load bearing studs 22 gauge or lighter | 3-1/4 | 2-1/4 | 3-3/4 | 25009 | 100 | 36 |
| 22.5 | 1099-SS* | Steel stud screws for use with non-load bearing studs 22 gauge or lighter | 3-9/16 | 2-1/4 | 3-3/4 | 26001 | 100 | 38 |

Series "Z" Hanger



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|--------------------------|--|--------|-------|-------|------------|----------------|---------------------|
| 18.0 | 1096-Z2 | 1/4" offset, "Z" hanger | 3 | 2-1/4 | 3-3/4 | 24402 | 50 | 24 |
| 18.0 | 1096-Z4 | 1/2" offset, "Z" hanger | 3 | 2-1/4 | 3-3/4 | 24406 | 50 | 27 |
| 20.5 | 1098-Z2* (Top photo) | 1/4" offset, "Z" hanger | 3-1/4 | 2-1/4 | 3-3/4 | 25030 | 50 | 24 |
| 20.5 | 1098-Z4 | 1/2" offset, "Z" hanger | 3-1/4 | 2-1/4 | 3-3/4 | 25040 | 50 | 27 |
| 20.5 | 1098-Z4H* (Btm photo) | 1/2" offset, horizontal mount "Z" hanger | 3-1/4 | 2-1/4 | 3-3/4 | 25025 | 50 | 27 |
| 22.5 | 1099-Z4 | 1/2" offset, "Z" hanger | 3-9/16 | 2-1/4 | 3-3/4 | 26003 | 50 | 28 |

9303-H



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|-------|-------|-------|------------|----------------|---------------------|
| 6.0 | 9303-H | Side mount hanger, 1/4" offset, not UL@ listed | 1-1/8 | 2-1/4 | 3-5/8 | 10021 | 100 | 20 |

9327-N



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|-----------------------|-------|-------|-------|------------|----------------|---------------------|
| 20.5 | 9327-N | Back nails | 3-1/4 | 2-3/8 | 3-1/4 | 10195 | 50 | 21 |

* Indicates model shown - See page 7 for Attachment Coding descriptions

ALLIED MOULDED DOUBLE GANG RECEPTACLE BOX

[RELATED SECTION 26 05 33.16]

Model Number: 2300-NK

Location: throughout The Solar Homestead

Dimensions:

Width: 4"

Height: 3-3/4"

Depth: 3"

Finish: thermoset-fiberglass

Features:

Volume: 32.5 in³

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution



Two Gang

Residential Switch or Receptacle Box



Series 2300-2Z2



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|---|-------|------------|----------------|---------------------|
| 32.5 | 2300-2Z2 | 1/4" offset, "Z" hanger each side of box, Speed Klamps™-bulk packed | 3 | 4 | 3-3/4 | 12500 | 12 | 11 |
| 32.5 | 2300-2Z2K* | 1/4" offset, "Z" hanger each side of box, Speed Klamps™-factory installed | 3 | 4 | 3-3/4 | 12501 | 12 | 11 |

Series 2300-N



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|---|-------|------------|----------------|---------------------|
| 32.5 | 2300-N | Angled mid-nails, Speed Klamps™-bulk packed | 3 | 4 | 3-3/4 | 12125 | 50 | 29 |
| 32.5 | 2300-NC2 | Angled mid-nails, 2 wire clamps-factory installed | 3 | 4 | 3-3/4 | 12135 | 50 | 31 |
| 32.5 | 2300-NC4 | Angled mid-nails, 4 wire clamps-factory installed | 3 | 4 | 3-3/4 | 12145 | 50 | 31 |
| 32.5 | 2300-NK* | Angled mid-nails, Speed Klamps™-factory installed | 3 | 4 | 3-3/4 | 12127 | 50 | 30 |

Series 2300-SS



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|---|---|-------|------------|----------------|---------------------|
| 32.5 | 2300-SS | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, Speed Klamps™-bulk packed | 3 | 4 | 3-3/4 | 12202 | 50 | 31 |
| 32.5 | 2300-SSK* | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, Speed Klamps™-factory installed | 3 | 4 | 3-3/4 | 12203 | 50 | 32 |

Series 2300-Z2



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|---|---|-------|------------|----------------|---------------------|
| 32.5 | 2300-Z2 | 1/4" offset, "Z" hanger, Speed Klamps™-bulk packed | 3 | 4 | 3-3/4 | 12400 | 50 | 35 |
| 32.5 | 2300-Z2K* | 1/4" offset, "Z" hanger, Speed Klamps™-factory installed | 3 | 4 | 3-3/4 | 12401 | 50 | 36 |
| 32.5 | 2300-Z4 | 1/2" offset, "Z" hanger, Speed Klamps™-bulk packed | 3 | 4 | 3-3/4 | 12700 | 50 | 38 |
| 32.5 | 2300-Z4K | 1/2" offset, "Z" hanger, Speed Klamps™-factory installed | 3 | 4 | 3-3/4 | 12701 | 50 | 39 |

Series 2302-N



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|--------|---|-------|------------|----------------|---------------------|
| 37.0 | 2302-N | Angled mid-nails, Speed Klamps™-bulk packed | 3-7/16 | 4 | 3-3/4 | 13060 | 50 | 31 |
| 37.0 | 2302-NC2 | Angled mid-nails, 2 wire clamps-factory installed | 3-7/16 | 4 | 3-3/4 | 13065 | 50 | 33 |
| 37.0 | 2302-NC4 | Angled mid-nails, 4 wire clamps-factory installed | 3-7/16 | 4 | 3-3/4 | 13070 | 50 | 35 |
| 37.0 | 2302-NK* | Angled mid-nails, Speed Klamps™-factory installed | 3-7/16 | 4 | 3-3/4 | 13075 | 50 | 32 |
| | 2302-NKRED | Same as 2302-NK but molded in red for fire circuits | | | | 96501 | 12 | 8 |

* Indicates model shown • See page 7 for Attachment Coding descriptions

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ALLIED MOULDED THREE GANG RECEPTACLE BOX

[RELATED SECTION 26 05 33.16]

Model Number: 3300-NK

Location: throughout The Solar Homestead

Dimensions:

Width: 5-11/16"

Height: 3-3/4"

Depth: 3"

Finish: thermoset-fiberglass

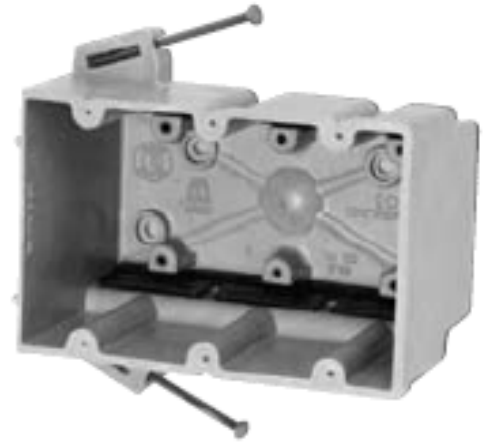
Features:

Volume: 46 in³

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution



Three Gang:

Residential Switch or Receptacle Box



Series 3300-2Z2



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|---------|-------|------------|----------------|---------------------|
| 46.0 | 3300-2Z2 | 1/4" offset, "Z" hanger each side of box, Speed Klamps™-bulk packed | 3 | 5-11/16 | 3-3/4 | 14700 | 25 | 26 |
| 46.0 | 3300-2Z2K* | 1/4" offset, "Z" hanger each side of box, Speed Klamps™-factory installed | 3 | 5-11/16 | 3-3/4 | 14702 | 25 | 26 |
| 46.0 | 3300-2Z4 | 1/2" offset, "Z" hanger each side of box, Speed Klamps™-bulk packed | 3 | 5-11/16 | 3-3/4 | 15120 | 25 | 26 |
| 46.0 | 3300-2Z4K | 1/2" offset, "Z" hanger each side of box, Speed Klamps™-factory installed | 3 | 5-11/16 | 3-3/4 | 15121 | 25 | 26 |

Series 3300-N



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|---------|-------|------------|----------------|---------------------|
| 46.0 | 3300-N | Angled mid-nails, Speed Klamps™-bulk packed | 3 | 5-11/16 | 3-3/4 | 14175 | 20 | 16 |
| 46.0 | 3300-NC3 | Angled mid-nails, 3 wire clamps-factory installed | 3 | 5-11/16 | 3-3/4 | 14190 | 20 | 17 |
| 46.0 | 3300-NC6 | Angled mid-nails, 6 wire clamps-factory installed | 3 | 5-11/16 | 3-3/4 | 14205 | 20 | 18 |
| 46.0 | 3300-NK* | Angled mid-nails, Speed Klamps™-factory installed | 3 | 5-11/16 | 3-3/4 | 14177 | 20 | 17 |

Series 3300-NB



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|---------|-------|------------|----------------|---------------------|
| 46.0 | 3300-NB | Angled mid-nails, adj. stabilizing bar, Speed Klamps™-bulk packed | 3 | 5-11/16 | 3-3/4 | 14210 | 20 | 20 |
| 46.0 | 3300-NBC3 | Angled mid-nails, adj. stabilizing bar, 3 wire clamps-factory installed | 3 | 5-11/16 | 3-3/4 | 14225 | 20 | 22 |
| 46.0 | 3300-NBK* | Angled mid-nails, adj. stabilizing bar, Speed Klamps™-factory installed | 3 | 5-11/16 | 3-3/4 | 14212 | 20 | 21 |

Series 3300-SS



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|---|---------|-------|------------|----------------|---------------------|
| 46.0 | 3300-SS | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, Speed Klamps™-bulk packed | 3 | 5-11/16 | 3-3/4 | 14522 | 20 | 18 |
| 46.0 | 3300-SSK* | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, Speed Klamps™-factory installed | 3 | 5-11/16 | 3-3/4 | 14524 | 20 | 19 |

* Indicates model shown - See page 7 for Attachment Coding descriptions

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ALLIED MOULDED FOUR GANG RECEPTACLE BOX

[RELATED SECTION 26 05 33.16]

Model Number: 4300-NK

Location: Core Module Bath

Dimensions:

Width: 7-1/2"

Height: 3-3/4"

Depth: 3"

Finish: thermoset-fiberglass

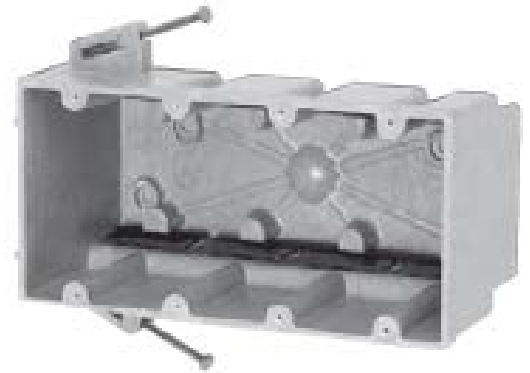
Features:

Volume: 60 in³

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution

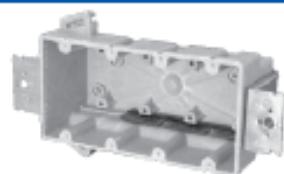


Four Gang

Residential Switch or Receptacle Box



Series 4300-2Z2



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|-------|-------|------------|----------------|---------------------|
| 60.0 | 4300-2Z2 | 1/4" offset, "Z" hanger each side of box, Speed Klamps™-bulk packed | 3 | 7-1/2 | 3-3/4 | 16905 | 12 | 15 |
| 60.0 | 4300-2Z2K* | 1/4" offset, "Z" hanger each side of box, Speed Klamps™-factory installed | 3 | 7-1/2 | 3-3/4 | 16907 | 12 | 15 |

Series 4300-N



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|-------|-------|------------|----------------|---------------------|
| 60.0 | 4300-N | Angled mid-nails, Speed Klamps™-bulk packed | 3 | 7-1/2 | 3-3/4 | 16225 | 20 | 18 |
| 60.0 | 4300-NC4 | Angled mid-nails, 4 wire clamps-factory installed | 3 | 7-1/2 | 3-3/4 | 16245 | 20 | 20 |
| 60.0 | 4300-NK* | Angled mid-nails, Speed Klamps™-factory installed | 3 | 7-1/2 | 3-3/4 | 16226 | 20 | 19 |

Series 4300-NB



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|---|---|-------|-------|------------|----------------|---------------------|
| 60.0 | 4300-NB | Angled mid-nails, adj. stabilizing bar, Speed Klamps™-bulk packed | 3 | 7-1/2 | 3-3/4 | 16270 | 20 | 25 |
| 60.0 | 4300-NBC4 | Angled mid-nails, adj. stabilizing bar, 4 wire clamps-factory installed | 3 | 7-1/2 | 3-3/4 | 16290 | 20 | 26 |
| 60.0 | 4300-NBK* | Angled mid-nails, adj. stabilizing bar, Speed Klamps™-factory installed | 3 | 7-1/2 | 3-3/4 | 16271 | 20 | 25 |

Series 4300-SS



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|---|-------|-------|------------|----------------|---------------------|
| 60.0 | 4300-SS | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, Speed Klamps™-bulk packed | 3 | 7-1/2 | 3-3/4 | 16233 | 20 | 20 |
| 60.0 | 4300-SSK* | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, Speed Klamps™-factory installed | 3 | 7-1/2 | 3-3/4 | 16232 | 20 | 21 |

Series 4300-SSB



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|---|-------|-------|------------|----------------|---------------------|
| 60.0 | 4300-SSB | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, adj. stabilizing bar, Speed Klamps™-bulk packed | 3 | 7-1/2 | 3-3/4 | 16229 | 20 | 26 |
| 60.0 | 4300-SSBK* | Steel stud screws for use with non-load bearing studs 22 gauge or lighter, adj. stabilizing bar, Speed Klamps™-factory installed | 3 | 7-1/2 | 3-3/4 | 16234 | 20 | 27 |

Series 4300-Z2



| Cu. In. Volume | Catalog Number | Component Description | D | W | H | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) |
|----------------|----------------|--|---|-------|-------|------------|----------------|---------------------|
| 60.0 | 4300-Z2 | 1/4" offset, "Z" hanger, Speed Klamps™-bulk packed | 3 | 7-1/2 | 3-3/4 | 16725 | 12 | 14 |
| 60.0 | 4300-Z2K* | 1/4" offset, "Z" hanger, Speed Klamps™-factory installed | 3 | 7-1/2 | 3-3/4 | 16906 | 12 | 14 |

* Indicates model shown - See page 7 for Attachment Coding descriptions



ALLIED MOULDED 3/0 ROUND OUTLET

[RELATED SECTION 26 05 33.16]

Model Number: 9335-NC2

Location: Flex Space

Dimensions:

Diameter: 2-7/8"

Depth: 3-1/2"

Finish: thermoset-fiberglass

Features:

Volume: 20.5 in³

Approval Certificates:

UL Listed

Available: Consolidated Electrical Distribution




3-1/2" Dia. Round Outlet


Residential Units




Series 9335-BH

| Cu. In. Volume | Catalog Number | Component Description | D | W | Fixture Rating | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) | |
|---|----------------|-----------------------|---|-------|----------------|------------|----------------|---------------------|----|
|  <p>For 16" to 24" on center Jeld applications</p> | 20.5 | 9335-BH | 16" to 24" adj. bar hanger, Speed Klamps™- bulk packed | 2-7/8 | 3-1/2 | 50 lb. | 88100 | 24 | 33 |
| | 20.5 | 9335-BHC2 | 16" to 24" adj. bar hanger, 2 wire clamps - factory installed | 2-7/8 | 3-1/2 | 50 lb. | 88116 | 24 | 35 |
| | 20.5 | 9335-BHK* | 16" to 24" adj. bar hanger, Speed Klamps™- factory installed | 2-7/8 | 3-1/2 | 50 lb. | 88101 | 24 | 34 |


Series 9335-BHG

| Cu. In. Volume | Catalog Number | Component Description | D | W | Fixture Rating | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) | |
|---|----------------|-----------------------|---|-------|----------------|------------|----------------|---------------------|----|
|  <p>For 16" to 24" on center Jeld applications</p> | 20.5 | 9335-BHG | 16" to 24" adj. bar hanger, ground strap, Speed Klamps™-bulk packed | 2-7/8 | 3-1/2 | 50 lb. | 88102 | 24 | 34 |
| | 20.5 | 9335-BHGC2 | 16" to 24" adj. bar hanger, ground strap, 2 wire clamps-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 88117 | 24 | 36 |
| | 20.5 | 9335-BHGK* | 16" to 24" adj. bar hanger, ground strap, Speed Klamps™-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 88103 | 24 | 35 |


Series 9335-HN

| Cu. In. Volume | Catalog Number | Component Description | D | W | Fixture Rating | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) | |
|--|----------------|------------------------|--|-------|----------------|------------|----------------|---------------------|----|
|  | 20.5 | 9335-HNGK* (Top photo) | Nail-on "HN" hanger, ground strap, Speed Klamps™-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 41823 | 50 | 37 |
| | 20.5 | 9335-HNK* (Btm photo) | Nail-on "HN" hanger, Speed Klamps™-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 41824 | 50 | 35 |

Series 9335-N

| Cu. In. Volume | Catalog Number | Component Description | D | W | Fixture Rating | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) | |
|---|----------------|-----------------------|---|-------|----------------|------------|----------------|---------------------|----|
|  | 20.5 | 9335-N | Fetter ring nails, Speed Klamps™-bulk packed | 2-7/8 | 3-1/2 | 50 lb. | 41160 | 50 | 27 |
| | 20.5 | 9335-NC2 | Fetter ring nails, 2 wire clamps-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 41170 | 50 | 28 |
| | 20.5 | 9335-NK* | Fetter ring nails, Speed Klamps™-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 41162 | 50 | 27 |
| | | 9335-NKRED | Same as 9335-NK but molded in red for fire circuits | | | | | | |

Series 9335-NG

| Cu. In. Volume | Catalog Number | Component Description | D | W | Fixture Rating | UPC# 85339 | Std. Pkg. Qty. | Std. Pkg. Wt. (lb.) | |
|---|----------------|-----------------------|--|-------|----------------|------------|----------------|---------------------|----|
|  | 20.5 | 9335-NG | Fetter ring nails, ground strap, Speed Klamps™-bulk packed | 2-7/8 | 3-1/2 | 50 lb. | 41180 | 50 | 28 |
| | 20.5 | 9335-NGC2 | Fetter ring nails, ground strap, 2 wire clamps-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 41190 | 50 | 29 |
| | 20.5 | 9335-NGK* | Fetter ring nails, ground strap, Speed Klamps™-factory installed | 2-7/8 | 3-1/2 | 50 lb. | 41182 | 50 | 28 |

* Indicates model shown • See page 7 for Attachment Coding descriptions

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RACO 2-GANG METAL SQUARE ELECTRICAL BOX

[RELATED SECTION 26 05 33.16]

Model Number: 8232

Location: Living Module, Outdoor Kitchen, OM Closets

Dimensions:

Length: 2-1/8"

Width: 4"

Depth: 2-1/8"

Features:

Capacity: 30.3 in³

Fire rating in minutes: 120

Approval Certificates:

UL Listed

Available: Lowes

Price: \$2.10





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Raco 2-Gang Metal Square Electrical Box

Item #: 70965 | Model #:8232

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\$0.91



Raco 2-Gang Metal Round Electrical Box

Not Yet Rated

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Raco 1-Gang Metal Round Electrical Box

Not Yet Rated

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| | | | |
|---------------------------------|--------|--------------------------------------|--------|
| Old or New Work | New | CSA Safety Listing | No |
| Construction Type | Welded | Box Cubic Inch Capacity (Cu. Inches) | 30.3 |
| Cover Included | No | ETL Safety Listing | No |
| Fire Rating in Minutes | 120 | Box Type | Wall |
| Box Height (Inches) | 2.125 | Low Voltage | Yes |
| Box Width (Inches) | 4.0 | Number of Gangs | 2.0 |
| Box Depth (Inches) | 2.125 | Knockout Options | 1/2" |
| Maximum Weight Supported (lbs.) | 6.0 | Deep | Yes |
| Approved for Outdoor Use | Yes | Application | Square |
| UL Safety Listing | Yes | Material | Metal |

4" SQUARE BOXES 1-1/2" AND 2-1/8" DEEP, PLENUM BOXES

Applications

- Plenum boxes are used in above-ceiling applications where air-tight enclosures are required
- Square boxes are used where multiple conductor runs are split into two or more directions to bring power to a number of electrical devices

Product Features

- To maintain plenum seal, both RACO® 226 and 239 do not provide ground screw holes
- Cover gasket is PVC foam material

Compliance

-  – File E195978



226



239



762

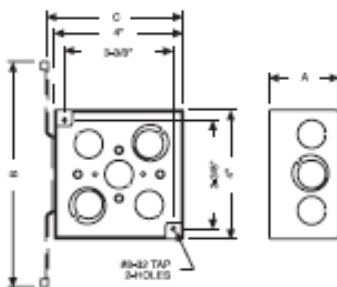
ORDERING INFORMATION - DIMENSIONS

| 4" SQUARE PLENUM - BOXES & COVER - 1-1/2" & 2-1/8" DEEP - DRAWN WITH CONDUIT KO'S | | | | | | |
|---|------------------------------------|------------------|------------------|---------|-----------|--------------|
| CATALOG NUMBER | DESCRIPTION BRACKET & SETBACK | KNOCKOUTS | | CU. IN. | STD. PKG. | UPC BAR CODE |
| | | SIDES | BOTTOM | | | |
| 226 | 1-1/2" Deep | 8-1/2" 4-3/4" | 3-1/2" 2-3/4" | 21.0 | 50 | — |
| 239 | 2-1/8" Deep | 8-1/2" 4-3/4" | 3-1/2" 2-3/4" | 30.3 | 25 | — |
| 762 | Gasketed cover for 4" square boxes | — | — | — | 50 | — |

DIMENSIONS

| CATALOG NUMBER | A | B | C |
|----------------|--------|---|---|
| 226 | 1-1/2" | — | — |
| 239 | 2-1/8" | — | — |

4" SQUARE BOXES



GAMPAK 2.17" RECTANGULE METAL ELECTRICAL BOX

[RELATED SECTION 26 05 33.16]

Model Number: 14252

Location: OM Closet 3

Features:

- Number of gangs: 1

- Die cast construction

- Powder coated for corrosion resistance

Approval Certificates:

- UL Listed

- CSA Listed

Available: Lowes

Price: \$3.70





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Home : [Gampak 2.17" Rectangle Metal Electrical Box Cover](#)



Gampak 2.17" Rectangle Metal Electrical Box Cover

Item #: 71209 | Model #:14250

★★★★★ Be the first to write a review!

\$3.70

Customers Also Viewed



REDDOT 6" Rectangle Plastic Electrical Box...

Not Yet Rated



Raco 1-Gang Metal Handy Electrical Box

Not Yet Rated

\$0.91



CARLON 4" x 4" x 2" Junction Box

Not Yet Rated

\$6.38



REDDOT 6" Rectangle Plastic Electrical Box...

Not Yet Rated



REDDOT 1-Gang Metal Old Work Electrical Box

Not Yet Rated

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

UL Safety Listing

Yes

Number of Gangs

1.0

CSA Safety Listing

Yes

Material

Metal

ETL Safety Listing

No

GAMPAK 2.29" RECTANGULE METAL ELECTRICAL BOX COVER

[RELATED SECTION 26 05 33.16]

Model Number: 14353-5

Location: Main House Mechanical Closet, Electrical Closet, Outdoor Kitchen Mechanical Closet

Features:

- Number of gangs: 2

- Die cast construction

- Powder coated for corrosion resistance

Approval Certificates:

- UL Listed

- CSA Listed

Available: Lowes

Price: \$11.25





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[Cover](#)



Gampak 2.29" Square Metal Electrical Box Cover

Item #: 72243 | Model #:14353-5

★★★★★ Be the first to write a review!

\$11.25

Customers Also Viewed



Gampak 2.28" Square Metal Electrical Box...

Not Yet Rated

\$9.65



Gampak 2.17" Rectangle Metal Electrical Box...

Not Yet Rated

\$3.70



CANTEX Plastic New Work Electrical Box

Not Yet Rated

\$8.56



Raco 2-Gang Metal Square Electrical Box

Not Yet Rated

\$2.10

[Description](#)

[Specifications](#)

[Info & Guides](#)

[Reviews](#)

[Q&A](#)

UL Safety Listing

Yes

Number of Gangs

2.0

CSA Safety Listing

Yes

Material

Metal

ETL Safety Listing

No

TE SOLARLOK INTERCONNECTION SYSTEM CONNECTORS

[RELATED SECTION 26 05 83]



Model Number: 4-1394462-8

4-1394462-9

Location: Outdoor Kitchen Mechanical Closet

Features:

Connector: 4.0 mm²

Wire size: 10 AWG, 4.5 - 6.0 mm

Insulation outside diameter: 0.177 - 0.236"

Approval Certificates:

UL Listed

Available: TTI



The Only Wholesale Distributor You'll Ever Need



A + A - RESET

Overview

- Solar Modules
- Mounting Structures
- Wind Power
- Inverters
- Power Systems
- Charge Controllers
- Meters & Monitoring
- Batteries
- Electrical Distribution Parts
- Wire & Cable
 - › Battery cables
 - › Cable lugs and accessories
 - › Bulk wire
 - › Array wiring
 - › Array wiring accessories
 - Array adaptors
 - **Array connectors**
 - Cable clips
- Water Pumping
- Tools
- Electrical Vehicle Charging Stations

NOTE: AEE Solar sells these products as a wholesale distributor exclusively to its authorized dealers. Email us at salesupport@eesolar.com to find an AEE Solar dealer near you.

Array connectors

MC4-Solarline 2 Branch Connectors



These waterproof Y-connectors make it possible to parallel wire PV modules with Multi-Contact output cables. Maximum current allowed through connectors is 30 amps.

The AEE Solar web catalog is sponsored by:



| Description | Item code |
|--|-----------|
| Solarline 2 branch cable coupler female - 2 male | 052-09403 |
| Solarline 2 branch cable coupler male - 2 female | 052-09404 |

MC4-Solarline 2 Connectors



The connector can be assembled quickly on site by a contractor allowing assembly of custom cables at the job site. A special crimping tool and wrench set are required to assemble the connector. We have connectors for 10 AWG USE-2 wire and for larger diameter 10AWG PV wire. Sold in Packs of 25 connectors.

| Connector description | Item code |
|---|-----------|
| Male MC4 locking connector for USE-2 wire | 097-01407 |
| Female MC4 locking connector for USE-2 wire | 097-01409 |
| Male MC4 locking connector for PV wire | 097-01411 |
| Female MC4 locking connector for PV wire | 097-01413 |
| MC safety locking sleeve PV-SSH4 – pack of 25 | 097-01419 |

Tyco SolarLok connectors



These connectors can be assembled quickly on site by a contractor allowing assembly of custom cables at the job site. A special crimping tool and wrench set are required to assemble the connector. For 10 AWG USE-2 wire. Sold in packs of 25.

| Connector description | Item code |
|--|-----------|
| SolarLok male neutral connector - 25 pack | 097-01361 |
| SolarLok female negative connector - 25 pack | 097-01366 |

Installation Manual

Table 1

| Available Connector Kits for SOLARLOK Interconnection System | | | |
|--|--------------|----------------------------|--------------------------------|
| Female Cable Connectors | | | |
| Part Number | Description | Wire Size | Insulation O.D. Range |
| 4-1394462-6 | Plus Female | 2.5mm ² / 14AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 4-1394462-8 | Plus Female | 4.0mm ² / 12AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 6-1394462-3 | Plus Female | 6.0mm ² / 10AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 4-1394462-7 | Minus Female | 2.5mm ² / 14AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 4-1394462-9 | Minus Female | 4.0mm ² / 12AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 6-1394462-4 | Minus Female | 6.0mm ² / 10AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| Male Cable Connectors | | | |
| 1394461-7 | Plus Male | 2.5mm ² / 14AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 7-1394461-0 | Plus Male | 4.0mm ² / 12AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 7-1394461-3 | Plus Male | 6.0mm ² / 10AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 1394461-8 | Minus Male | 2.5mm ² / 14AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 7-1394461-1 | Minus Male | 4.0mm ² / 12AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 7-1394461-4 | Minus Male | 6.0mm ² / 10AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 6-1394461-3 | Neutral Male | 2.5mm ² / 14AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 7-1394461-2 | Neutral Male | 4.0mm ² / 12AWG | 4.5 to 6.0 mm / 0.177-0.236 in |
| 7-1394461-5 | Neutral Male | 6.0mm ² / 10AWG | 4.5 to 6.0 mm / 0.177-0.236 in |



Male housing



Female housing

MC3 CABLE COUPLERS

[RELATED SECTION 26 05 83]

Model Number: MC3 32.0062-10

MC3 32.0063-10

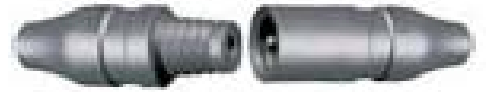
Location: underneath trailers

Electrical:

Voltage: 1000V

Current: 30 A

Available: Alternative Energy Engineering



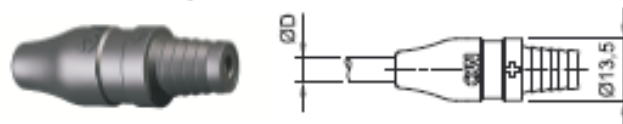
Plug connectors MC3

Male and female cable couplers MC3

Male cable coupler ⊖



Female cable coupler ⊕



| Cable cross section | Ø D (Cable outer diameter) | Packaging unit | | Male cable coupler Order No. | Female cable coupler Order No. | Rated current | Rated voltage | Approvals |
|------------------------|----------------------------|----------------|---------|------------------------------|--------------------------------|---------------|------------------------------|-----------|
| | | 10 pc. | 100 pc. | | | | | |
| 2,5 – 4mm ² | 4,9 – 7,1mm | x | | 32.0003-10 | 32.0002-10 | 20A | 1000V (IEC/CEI) 600V (UL) | |
| 2,5 – 4mm ² | 4,9 – 7,1mm | | x | 32.0003-100 | 32.0002-100 | 20A | 1000V (IEC/CEI) 600V (UL) | |
| 6mm ² | 4,9 – 7,1mm | x | | 32.0063-10 | 32.0062-10 | 30A | 1000V | |
| 6mm ² | 4,9 – 7,1mm | | x | 32.0063-100 | 32.0062-100 | 30A | 1000V | |

Assembly tools see page 11

Assembly instructions MA207 www.multi-contact.com

Male and female panel receptacles MC3

Male panel receptacle



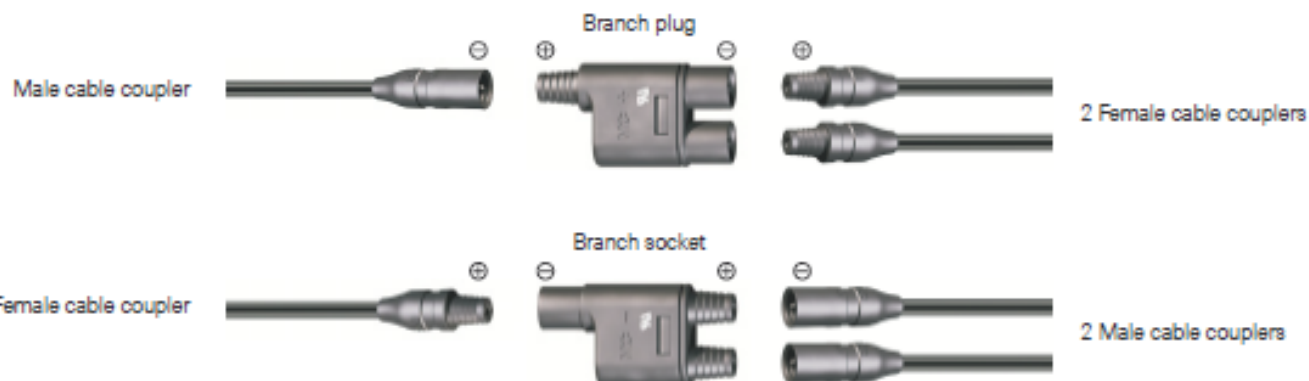
Female panel receptacle



| Cable cross section | Packaging unit | | Male panel receptacle Order No. | Female panel receptacle Order No. | Rated current | Rated voltage | Approvals |
|------------------------|----------------|---------|---------------------------------|-----------------------------------|---------------|---------------|-----------|
| | 10 pc. | 100 pc. | | | | | |
| 2,5 – 4mm ² | x | | 32.0053P0010 | 32.0052P0010 | 20A | 1000V | |
| 6mm ² | | x | 32.0049P0100 | 32.0048P0100 | 30A | 1000V | |

PV-Branch plugs and sockets MC3

For safe and simple parallel- or serialparallel connection of PV-modules.



| Branch plug Order No. | Branch socket Order No. | Rated current | Rated voltage | Approvals |
|-----------------------|-------------------------|---------------|----------------------------|-----------|
| 32.0009-UR | 32.0008-UR | 30A | 1000V (IEC/CEI), 600V (UL) | |

MC3 PV BRANCH PLUGS

[RELATED SECTION 26 05 83]

Model Number: MC3 32.0009-UR

Location: underneath trailers

Electrical:

Voltage: 1000 V

Current: 30 A

Available: Alternative Energy Engineering



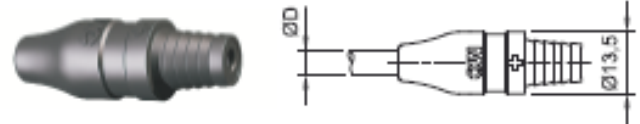
Plug connectors MC3

Male and female cable couplers MC3

Male cable coupler ⊖



Female cable coupler ⊕



| Cable cross section | Ø D (Cable outer diameter) | Packaging unit | | Male cable coupler Order No. | Female cable coupler Order No. | Rated current | Rated voltage | Approvals |
|------------------------|----------------------------|----------------|---------|------------------------------|--------------------------------|---------------|------------------------------|-----------|
| | | 10 pc. | 100 pc. | | | | | |
| 2,5 – 4mm ² | 4,9 – 7,1mm | x | | 32.0003-10 | 32.0002-10 | 20A | 1000V (IEC/CEI) 600V (UL) | |
| 2,5 – 4mm ² | 4,9 – 7,1mm | | x | 32.0003-100 | 32.0002-100 | 20A | 1000V (IEC/CEI) 600V (UL) | |
| 6mm ² | 4,9 – 7,1mm | x | | 32.0063-10 | 32.0062-10 | 30A | 1000V | |
| 6mm ² | 4,9 – 7,1mm | | x | 32.0063-100 | 32.0062-100 | 30A | 1000V | |

Assembly tools see page 11

Assembly instructions MA207 www.multi-contact.com

Male and female panel receptacles MC3

Male panel receptacle



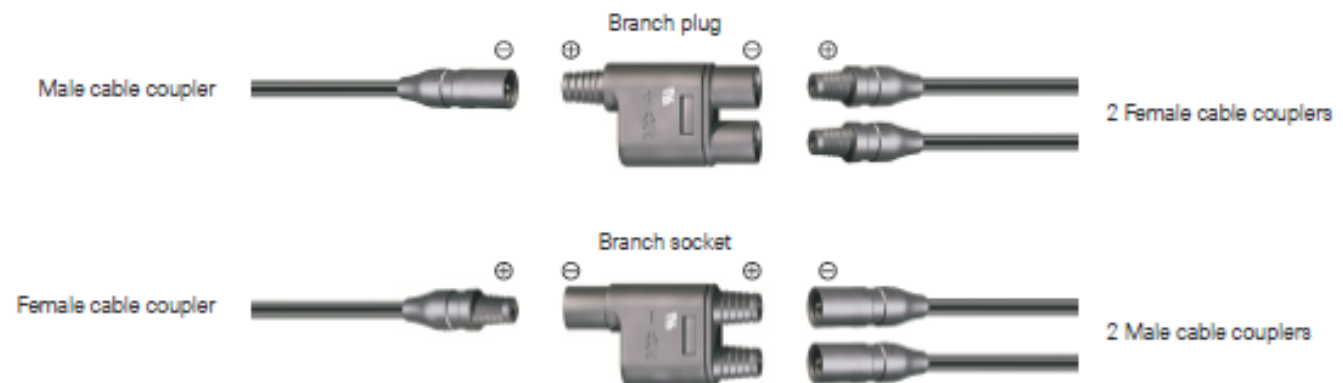
Female panel receptacle



| Cable cross section | Packaging unit | | Male panel receptacle Order No. | Female panel receptacle Order No. | Rated current | Rated voltage | Approvals |
|------------------------|----------------|---------|---------------------------------|-----------------------------------|---------------|---------------|-----------|
| | 10 pc. | 100 pc. | | | | | |
| 2,5 – 4mm ² | x | | 32.0053P0010 | 32.0052P0010 | 20A | 1000V | |
| 6mm ² | | x | 32.0049P0100 | 32.0048P0100 | 30A | 1000V | |

PV-Branch plugs and sockets MC3

For safe and simple parallel- or serialparallel connection of PV-modules.



| Branch plug Order No. | Branch socket Order No. | Rated current | Rated voltage | Approvals |
|-----------------------|-------------------------|---------------|----------------------------|-----------|
| 32.0009-UR | 32.0008-UR | 30A | 1000V (IEC/CEI), 600V (UL) | |

MC3 PV BRANCH SOCKETS

[RELATED SECTION 26 05 83]

Model Number: MC3 32.008-UR

Location: underneath trailers

Electrical:

Voltage: 1000 V

Current: 30 A

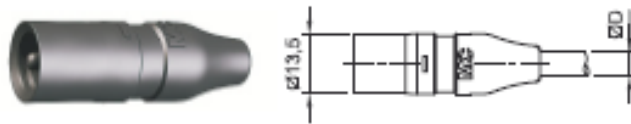
Available: Alternative Energy Engineering



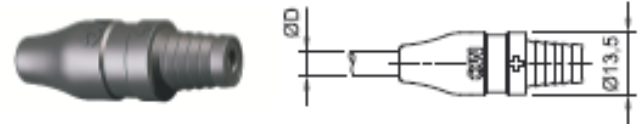
Plug connectors MC3

Male and female cable couplers MC3

Male cable coupler ⊖



Female cable coupler ⊕



| Cable cross section | Ø D (Cable outer diameter) | Packaging unit | | Male cable coupler Order No. | Female cable coupler Order No. | Rated current | Rated voltage | Approvals |
|------------------------|----------------------------|----------------|---------|------------------------------|--------------------------------|---------------|------------------------------|-----------|
| | | 10 pc. | 100 pc. | | | | | |
| 2,5 – 4mm ² | 4,9 – 7,1mm | x | | 32.0003-10 | 32.0002-10 | 20A | 1000V (IEC/CEI) 600V (UL) | |
| 2,5 – 4mm ² | 4,9 – 7,1mm | | x | 32.0003-100 | 32.0002-100 | 20A | 1000V (IEC/CEI) 600V (UL) | |
| 6mm ² | 4,9 – 7,1mm | x | | 32.0063-10 | 32.0062-10 | 30A | 1000V | |
| 6mm ² | 4,9 – 7,1mm | | x | 32.0063-100 | 32.0062-100 | 30A | 1000V | |

Assembly tools see page 11

Assembly instructions MA207 www.multi-contact.com

Male and female panel receptacles MC3

Male panel receptacle



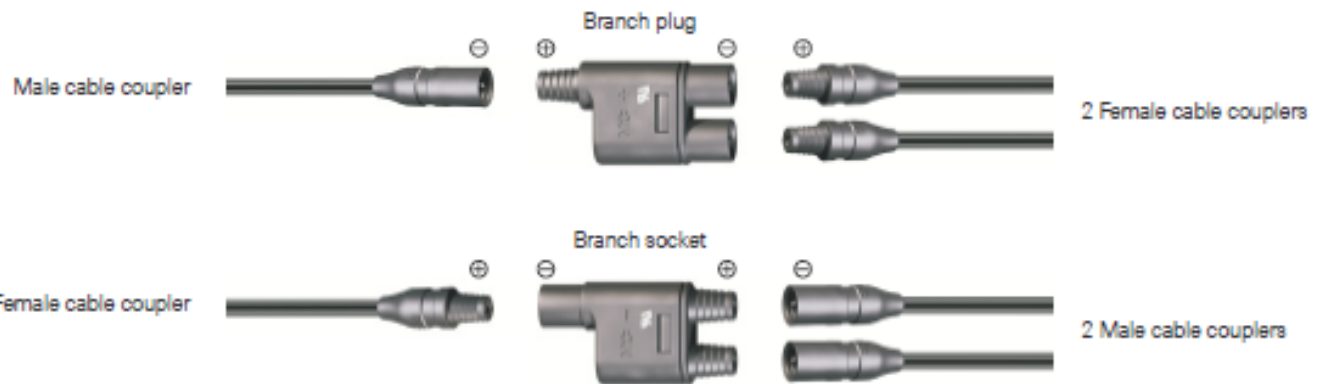
Female panel receptacle



| Cable cross section | Packaging unit | | Male panel receptacle Order No. | Female panel receptacle Order No. | Rated current | Rated voltage | Approvals |
|------------------------|----------------|---------|---------------------------------|-----------------------------------|---------------|---------------|-----------|
| | 10 pc. | 100 pc. | | | | | |
| 2,5 – 4mm ² | x | | 32.0053P0010 | 32.0052P0010 | 20A | 1000V | |
| 6mm ² | | x | 32.0049P0100 | 32.0048P0100 | 30A | 1000V | |

PV-Branch plugs and sockets MC3

For safe and simple parallel- or serialparallel connection of PV-modules.



| Branch plug Order No. | Branch socket Order No. | Rated current | Rated voltage | Approvals |
|-----------------------|-------------------------|---------------|----------------------------|-----------|
| 32.0008-UR | 32.0008-UR | 30A | 1000V (IEC/CEI), 600V (UL) | |

3M SCOTCHLOK CONNECTOR

[RELATED SECTION 26 05 83]

Model Number: UR2

Location: throughout The Solar Homestead

Features:

Insulation outside diameter: 0.082" [2.08 mm]

PIC-unfilled: 19-26 AWG

PIC-filled: 19-26 AWG

Approval Certificates:

UL Listed

Available: Alternative Energy Engineering





Scotchlok™

UR2, UY2 and UB2A Connectors

Proven splicing technology designed for your specific splicing applications.



Over 30 years ago, 3M introduced the industry's original IDC Connector, the 3M™ Scotchlok UR Connector. The latest series of connectors, the Scotchlok UR2, UY2, and UB2A Connectors, feature that same originality in technological advantages. Building on the successful Scotchlok Connector's design, shape, color-coded cap concepts, and element technology, the Scotchlok Series 2 Connectors additionally incorporate full wire range capability, increased port size to accommodate up to .082" (2.08 mm) insulation sizes, double elements in all products and a new solvent resistant plastic construction.

The UR2 Connector for general butt splicing

The UR2 Connector accepts any two or three solid copper conductor combinations of 19-26 AWG (0.9mm - 0.4 mm) air core or filled cable with a maximum insulation O.D. of .082" (2.08 mm). The wires joined can be of

different wire gauges.

Its three ports accept two or three conductors for butt splicing. And like most Scotchlok Connectors, the UR2 is filled with a sealant to provide moisture resistance. A dry version of the UR2, the UR2-D, is also available.

The UR2 and UR2-D Connectors are available in box, bulk, bin, jumbo package and cartridge. The cartridges, containing ten connectors each, are for use with the Scotchlok E-9C Series Tools.

The UY2 Connector for smaller splice bundles

Approximately half the size of the UR2, the UY2 Connector can handle a higher pair count cable and keep the splicing bundle O.D. to a minimum.

The UY2's two ports accept any two solid copper conductor combinations of 19-26 AWG (0.9 mm - 0.4 mm) filled or air core cable with a maximum insulation O.D. of .082" (2.08 mm). The wires joined can be of

different wire gauges. Factory inserted sealant insulates the connections, protects against corrosion, and seals out moisture. In addition, the UY2 is available in a dry version, the UY2-D.

The UY2 and UY2-D are available in box, bulk, bin and cartridge.

The UB2A Connector: a unique time-saver for tap splicing

The pre-crimp feature of this compact bridging connector gives the craftsperson a time saving edge. By positioning the UB2A on the conductor and pre-crimping, the conductor is prevented from slipping out of the connector before the crimp is completed. A thin membrane molded into the tap wire entry port also assists the craftsperson by securing the tap wire until the crimp is completed. Like the UR2, a factory-installed sealant insulates against corrosion, and seals out moisture. The UB2A-D, a dry version, is available as well.

The UB2A permits tapping directly onto an existing conductor without interrupting service. In ready access closures, the UB2A eliminates cutting cable pairs, opening pairs, and piecing out wires.

Fast and easy to work with, the UB2A accepts 19-26 AWG (0.9 mm - 0.4 mm) plastic-, paper-, or pulp-insulated solid copper wire with a maximum O.D. of .082" (2.08 mm). The wires joined can be of different wire gauges.

The UB2A and UB2A-D are available in box, bulk and bin.

Dry versions of connectors

The UR2-D, UY2-D and UB2A-D are dry versions of the UR2, UY2 and UB2A. They are designed for splicing PIC, pulp and paper conductors where a nonfilled connector is preferred.

3M™ Scotchlok™ UR2, UY2 and UB2A Connectors

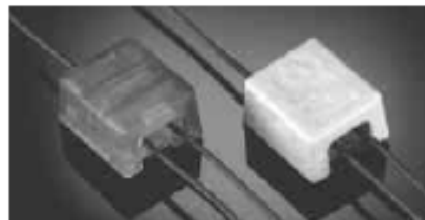
Ordering Information



2



3



4

Scotchlok UR2/UR2-D

Butt Connector

Box (UR2 only)

Packing: 100/box, 1000/cs., 3 lbs.
(1.36 kg./cs)

Shipping Unit: 1000 connectors

Bulk

Packing: 500/box, 5000/cs.,
15.2 lbs. (6.7 kg)/cs.

Shipping Unit: 5000 connectors

Bin

Packing: 20/bag, 1000/bin, 3.0 lbs.
(1.4 kg)/cs.

Shipping Unit: 1000 connectors

Cartridge

Packing: 10/cart., 100/pk., 1000/cs.,
4.6 lbs. (2.09 kg)/cs.

Shipping Unit: 1000 connectors
(10 packs)

Scotchlok UY2/UY2-D

Butt Connector

Box (UY2 only)

Packing: 100/box, 1000/cs., 1.3 lbs.
(0.9 kg)/cs.

Shipping Unit: 1000 connectors

Bulk

Packing: 1000/box, 5000/cs., 6.1 lbs.
(2.8 kg)/cs.

Shipping Unit: 5000 connectors

Bin

Packing: 20/bag, 1000/bin, 1.5 lbs.
(0.68 kg)/cs.

Shipping Unit: 1000 connectors

Cartridge

Packing: 12/cart., 120/pk., 1200/cs.,
3.5 lbs. (1.4 kg)/cs.

Shipping Unit: 1200 connectors
(10 packs)

Scotchlok UB2A/UB2A-D

Tap Connector

Box

Packing: 100/box, 1000/cs., 2.6 lbs.
(1.2 kg)/cs.

Shipping Unit: 1000 connectors

Bin

Packing: 20/bag, 1000/bin, 2.5 lbs.
(1.1 kg)/cs.

Shipping Unit: 1000 connectors

Bulk

Packing: 500/box, 5000/cs.
12.9 lbs. (5.9 kg)/cs.

Shipping Unit: 1000 connectors

Product Specifications

| SCOTCHLOK CONNECTOR | TYPE CONNECTION | MAXIMUM INSULATION O.D. | | CABLE TYPE | | | APPROVED TOOLS | | | |
|---------------------|-----------------|-------------------------|-------------|--------------|-------------|------------|----------------|----------------|-------------|--|
| | | in. | Metric (mm) | PIC-unfilled | | PIC-filled | | Pulp or Paper* | | |
| | | | | AWG | metric (mm) | AWG | metric (mm) | AWG | metric (mm) | |
| UR2 UR2-D | | .082 | 2.08 | 19-26 | 0.9-0.4 | 19-26 | 0.9-0.4 | 19-26 | 0.9-0.4 | |
| UY2 UY2-D | | .082 | 2.08 | 19-26 | 0.9-0.4 | 19-26 | 0.9-0.4 | 19-26 | 0.9-0.4 | |
| UB2A UB2A-D | | .082 | 2.08 | 19-26 | 0.9-0.4 | 19-26 | 0.9-0.4 | 19-26 | 0.9-0.4 | |

*Use caution to make sure insulation is pushed completely into connector before crimping. Scotchlok communication connectors may be used on standard polyethylene wire insulation, the polypropylene wire insulation of Filled Cable and on pulp. Use of a connector is limited only to port size. Wire sizes may be intermixed within a connector.

**The E-9BM and E-9C tools are recommended when splicing 19 AWG conductors.

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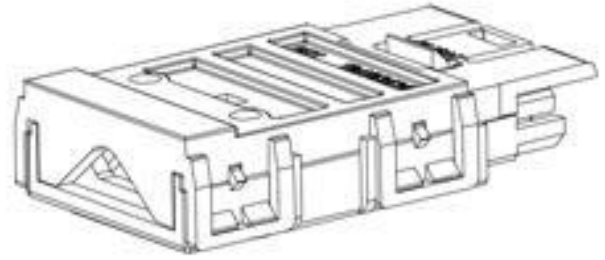
40% Pre-consumer waste paper
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© 3M 1998 80-6107-4679-6(1085.0)SP-1

MOLEX CONNECTOR

[RELATED SECTION 26 05 83]



Model Number:

Location: underneath trailers

Features:

Wire Size: 12 AWG, 14 AWG

Operating temperature range: 35°C - 85°C

Circuit Detail: 3 circuits with ground

Electrical:

Voltage: 300 V

Current: 20 A

Approval Certificates:

UL Listed

CSA Listed

Available: Mouser Electronics

Price: \$17.11

Part # / Keyword (English Only)

Product Detail

[All Products](#) » [Interconnects](#) » [Rectangular Connectors](#) » [Power Connectors](#) » [Heavy Duty Power Connectors](#) » [19401-1000](#)



Mouser Part #: 538-19401-1000
Manufacturer Part #: 19401-1000
Manufacturer: Molex
Description: Heavy Duty Power Connectors COC-2

[Data Sheet](#)

Images are for reference only
 See Product Specifications

[Customers Also Bought...](#)

Availability

Stock: 40 Can Ship Immediately
 241 Can Ship in 10 Days

On Order: 0

Factory Lead-Time: 4 Weeks

Enter Quantity: Minimum: 1
 Multiples: 1

Pricing (USD)

1: \$17.11
 10: \$16.21
 25: \$15.16
 50: \$13.78
 100: \$12.40
 200: \$11.30


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Specifications

Documents

My Notes

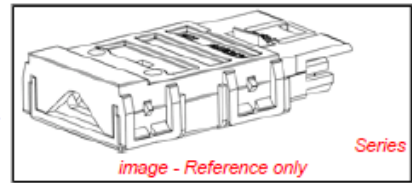
| | | |
|--|---|-------------------------------------|
| Manufacturer: | Molex | <input checked="" type="checkbox"/> |
| Product Category: | Heavy Duty Power Connectors | <input checked="" type="checkbox"/> |
| RoHS: |  Details | |
| Series: | 19401 Series | <input type="checkbox"/> |
| Housing Material: | Polycarbonate | <input type="checkbox"/> |
| Contact Material: | Copper | <input type="checkbox"/> |
| Contact Plating: | Tin | <input type="checkbox"/> |
| Voltage Rating: | 300 V | <input type="checkbox"/> |
| Current Rating: | 20 A | <input type="checkbox"/> |
| Insert / Contact Gender: | Male | |
| Number of Positions / Contacts: | 3 | |
| Packaging: | Bag | |
| Product Type: | SEOW/SJEW Connectors | |
| Standard Pack Qty: | 50 | |
| Termination Style: | IDC | |
| Wire Gauge Range: | 14-12 | |
| Part # Aliases: | 0194011000 COC-2, | |

[Add to Compare List](#)

[Show Similar](#)

PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION

Part Number: [0194011000](#)
Status: **Active**
Overview: [selfcontained power connector scpc](#)
Description: Self-Contained Power Connector for Solid Nonmetallic Sheathed Cable, 12-14 AWG



Documents:
[3D Model](#) [Product Specification PS-19902-011 \(PDF\)](#)
[Drawing \(PDF\)](#) [RoHS Certificate of Compliance \(PDF\)](#)

Agency Certification

CSA LR18689
 UL E182087

General

Product Family I/O Connectors
 Series [19401](#)
 Application Wire-to-Wire
 Comments Used to wire smoke detectors, 3-way lights, entertainment centers, and many other electrical applications using 110 and 220 AC circuits
 Component Type Plug, Receptacle
 MolexKits Yes
 Overview [selfcontained power connector scpc](#)
 Product Literature Order No 987650-0531
 Product Name SCPC
 Type N/A

Physical

Circuits (Loaded) 3
 Circuits (maximum) 3
 Circuits Detail 3 Circuits with Ground
 Color - Resin Clear, Natural
 Durability (mating cycles max) 250
 Flammability 94-5VA
 Lock to Mating Part Yes
 Material - Metal High Copper
 Material - Plating Mating Tin
 Material - Plating Termination Tin
 Material - Resin Polycarbonate, Polyester
 Number of Rows 1
 Orientation Vertical
 PCB Retention N/A
 Packaging Type Bag
 Panel Mount No
 Pitch - Mating Interface 10.60mm (.417")
 Plating min - Mating 1.016µm (40µ")
 Plating min - Termination 1.016µm (40µ")
 Polarized to Mating Part Yes
 Surface Mount Compatible (SMC) N/A
 Temperature Range - Operating -35°C to +85°C
 Termination Interface: Style IDT or Pierce
 Wire Size AWG 12, 14

Electrical

Current - Maximum per Contact 20A
 Voltage - Maximum 300V

Material Info

Old Part Number COC-2

Reference - Drawing Numbers

Product Specification PS-19902-011
 Sales Drawing SD-19401-002, SD-19401-1000

EU RoHS
 ELV and RoHS Compliant
REACH SVHC
 Not Reviewed
Low-Halogen Status
 Not Reviewed

China RoHS

Need more information on product environmental compliance?
 Email productcompliance@molex.com
 For a multiple part number RoHS Certificate of Compliance, [click here](#)
 Please visit the [Contact Us](#) section for any non-product compliance questions.

Search Parts in this Series
[19401Series](#)

Mates With
[194011000 Self-Contained Power Connector for Solid Cable, 12 to 14 AWG](#)

Application Tooling | [FAQ](#)
Tooling specifications and manuals are found by selecting the products below. Crimp Height Specifications are then contained in the Application Tooling Specification document.
Global

| Description | Product # |
|--|----------------------------|
| Hand Crimp Tool | 0192850074 |
| Hand Crimp Tool, SC0640015300 | |
| Power Connectors | |
| Manual Arbor Press, 0640060200 | |
| SC Power Connector | |

PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION

TED 5004-C WITH GOOGLE POWERMETER

[RELATED SECTION 26 09 13]

Model Number: 5004-C

Location: Electrical Closet, Main House Mechanical Closet

Features:

- 1 Gateway embedded with Footprints software

- 4 Measuring Transmitting Units/Current Transformers [in the Electrical Closet]

Electrical:

Wattage:

Voltage:

Load Rating:

Approval Certificates:

Available: TED The Energy Detective

Price: \$239.95





TED 5000-C (basic model with wireless display)

Availability: In stock

\$239.95Qty: [Add to Cart](#)

Quick Overview

This bestselling model features components necessary to monitor energy usage, plus a sleek, wireless display to serve as a friendly reminder to keep you aware of your household energy usage. In addition, you can use your computer or mobile device to track energy usage, monitor up to five individual appliances, project monthly bills, and view historical data.

The TED 5000-C package has the option to integrate with Google PowerMeter and includes:

- One Measuring Transmitting Unit with a set of Current Transformers (MTU/CT set)
- One Gateway embedded with Footprints software
- One sleek, wireless Display with AC/DC charger and charging stand

Product Description

Model 5000-C with Google PowerMeter

Includes:

- Gateway
- 1-MTU/CTs
- Display

Works with:

- Homes with Single Electrical Panels
- Homes with Single Electrical Panels and Solar or wind installations (will only record the net of generation/production) (to record generation/production separately, you will need to order the TED 5002-C)

Description:

Model 5000-C comes with all the components necessary to monitor energy usage, plus a sleek, wireless display to serve as a friendly reminder to keep you aware of your household energy usage. In addition, you can still use your computer or mobile device to track your energy data. The TED 5000-C package includes one set of CTs, one MTU, one Display, and one Gateway and works with Google PowerMeter.

MY CART

You have no items in your shopping cart.

VIEW A LIVE DEMO OF TED 5000



WHICH TED SHOULD I BUY?

Take a [quick survey](#) to help you decide which TED is right for you.

TED IN THE NEWS



LUTRON MAGNETIC LOW VOLTAGE DIMMER**[RELATED SECTION 26 09 33]**

Model Number: DVLV-600P [-WH, -GY]

Location: Interior White Walls [-WH], Interior Gray Walls [-GR]

Dimensions:

Width: 3"

Height: 4-3/4"

Depth: 1/2"

Finish: White and Gray

Features:

Control Type: Rocker

Actions: On/Off

Dimmer Type: Slide

Electrical:

Wattage: 450 W maximum

Voltage: 120 V

Load Rating: 600 VA

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Energy Star Qualified

Available: Lowes

Price: \$18.00





Shown actual size: Div^a preset dimmer and 1-gang Claro[®] wallplate in White (WH).

Product family features

- Large paddle switch with a captive linear-slide dimmer for a standard designer wallplate opening
- Preset dimmer
- Select lighter color models feature built-in soft-glow locator light
- C•L™ dimmers offer more reliable dimming performance over standard dimmers when dimming CFLs and LEDs; they also provide full range dimming for incandescent and halogen bulbs as well as mixed loads types
- C•L dimmers feature HED™ Technology with advanced dimming circuitry designed for compatibility with most high-efficacy light bulbs
- eco-dim[®] model available
- 1000W preset dimmers have voltage compensation, which maintains stable light levels, despite line voltage variations
- Coordinating Claro[®], Satin Colors[®] and Stainless Steel wallplates only available separately
- Custom engraving available for wallplates, see pg. 155

Control types

- 🔌 Single-pole (one location)
- 🔌🔌🔌 3-way or 4-way (two or more locations)

Direct load type compatibility

- 💡 Incandescent/halogen lighting
- 🔌 Magnetic low-voltage lighting
- 🔌 Electronic low-voltage lighting
- 🔌 Fluorescent lighting
- 🌀 LED lighting
- 💡/🌀 Dimmable CFL/LED lighting (screw-base)
- 🌀 Ceiling fans

Load type requiring load interface

- 🌀 Neon/cold cathode lighting

Lighting load interfaces may be applicable for some additional load type, voltage and capacity combinations.

For additional information, see pg. 174.

Dimmer model numbers

Incandescent/halogen dimmers

Dimmers

| | |
|--------------------------------|--|
| Single-pole 120V 600W | DV-600P- CC ³ DVSC-600P- CC ⁴ |
| Single-pole 120V 1000W | DV-10P- CC ³ DVSC-10P- CC ⁴ |
| 3-way 120V 600W | DV-603P- CC ³ DVSC-603P- CC ⁴ |
| 3-way 120V 1000W | DV-103P- CC ³ DVSC-103P- CC ⁴ |
| 3-way/single-pole 120V 600W | DVCL-153P- CC ³ |
| 3-way/single-pole 120V 600W | DVSCCL-153P- CC ⁴ |

Refer to the “how to calculate wattage when mixing lamp types” table on, www.lutron.com/dimcflled, when using a combination of bulb types with the C•L™ dimmer.

eco-dim® dimmer with locator light

| | |
|--------------------------------|----------------------------------|
| 3-way/single-pole 120V 600W | DV-603PG- EE ² |
|--------------------------------|----------------------------------|

eco-dim model guarantees at least 15% energy savings compared to a standard switch.

Dimmable CFL bulbs (screw-base)

Dimmable LED bulbs (screw-base)

Dimmers

| | |
|--------------------------------|-------------------------------------|
| 3-way/single-pole 120V 150W | DVCL-153P- CC ³ |
| 3-way/single-pole 120V 150W | DVSCCL-153P- CC ⁴ |

Refer to the “how to calculate wattage when mixing lamp types” table on, www.lutron.com/dimcflled, when using a combination of bulb types with the C•L dimmer.

Visit www.lutron.com for an approved list of dimmable CFL/LED bulbs.

Magnetic low-voltage dimmers

Dimmers

| | |
|-----------------------------------|--|
| Single-pole 120V 600VA (450W) | DVLV-600P- CC ³ DVSCLV-600P- CC ⁴ |
| Single-pole 120V 1000VA (800W) | DVLV-10P- CC ³ DVSCLV-10P- CC ⁴ |
| 3-way 120V 600VA (450W) | DVLV-603P- CC ³ DVSCLV-603P- CC ⁴ |
| 3-way 120V 1000VA (800W) | DVLV-103P- CC ³ DVSCLV-103P- CC ⁴ |

The stated VA (Volt-Ampere) rating includes the magnetic transformer heat losses and the lamp load. The stated W (Watt) rating is the maximum lamp wattage based on assumed 20% transformer loss.

CC³: Gloss color codes, see pg. 87

CC⁴: Satin color codes, see pg. 87

EE²: Available in White (WH), Ivory (IV), Almond (AL) and Light Almond (LA)

(Wallplates not included with above, order separately, see pg. 160)

All models must be derated if ganged unless otherwise noted, see pg. 170.

LUTRON MAGNETIC LOW VOLTAGE 3 WAY DIMMER**[RELATED SECTION 26 09 33]**

Model Number: DVLV-603P [-WH, -GR]

Location: Interior White Walls [-WH], Interior Gray Walls [-GR]

Dimensions:

Width: 3"

Height: 4-3/4"

Depth: 1/2"

Finish: White, Gray

Features:

Control Type: Rocker

Actions: On/Off

Dimmer Type: Slide

Suitable for low voltage lamps

Electrical:

Wattage: 450 W maximum

Voltage: 120 V

Load Rating: 600 VA

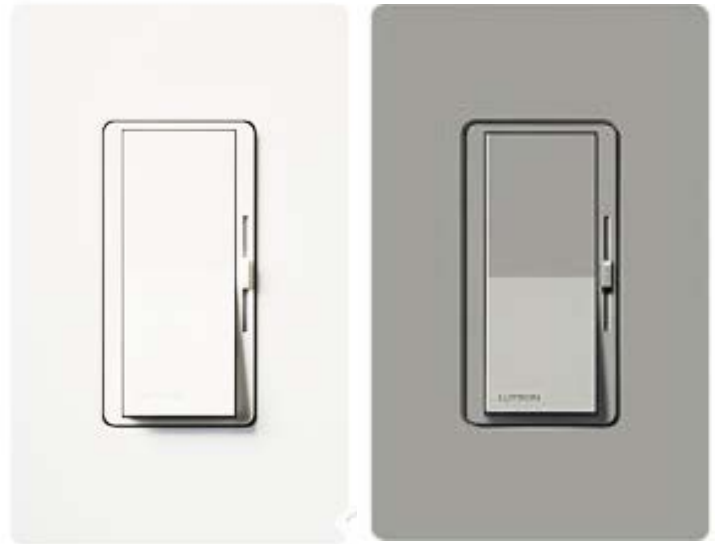
Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$39.00





Shown actual size: Diva preset dimmer and 1-gang Claro® wallplate in White (WH).

Product family features

- Large paddle switch with a captive linear-slide dimmer for a standard designer wallplate opening
- Preset dimmer
- Select lighter color models feature built-in soft-glow locator light
- C-L™ dimmers offer more reliable dimming performance over standard dimmers when dimming CFLs and LEDs; they also provide full range dimming for incandescent and halogen bulbs as well as mixed loads types
- C-L dimmers feature HED™ Technology with advanced dimming circuitry designed for compatibility with most high-efficacy light bulbs
- eco-dim® model available
- 1000W preset dimmers have voltage compensation, which maintains stable light levels, despite line voltage variations
- Coordinating Claro®, Satin Colors® and Stainless Steel wallplates only available separately
- Custom engraving available for wallplates, see pg. 155

Control types

- 🔌 Single-pole (one location)
- 🔌🔌🔌 3-way or 4-way (two or more locations)

Direct load type compatibility

- 💡 Incandescent/halogen lighting
- 🔌 Magnetic low-voltage lighting
- 🔌 Electronic low-voltage lighting
- 💡 Fluorescent lighting
- ⚙️ LED lighting
- 💡/⚙️ Dimmable CFL/LED lighting (screw-base)
- 🌀 Ceiling fans

Load type requiring load interface

- 🔌 Neon/cold cathode lighting

Lighting load interfaces may be applicable for some additional load type, voltage and capacity combinations.

For additional information, see pg. 174.

Dimmer model numbers

Incandescent/halogen dimmers

Dimmers

| | |
|--------------------------------|--|
| Single-pole 120V 600W | DV-600P- CC ³ DVSC-600P- CC ⁴ |
| Single-pole 120V 1000W | DV-10P- CC ³ DVSC-10P- CC ⁴ |
| 3-way 120V 600W | DV-603P- CC ³ DVSC-603P- CC ⁴ |
| 3-way 120V 1000W | DV-103P- CC ³ DVSC-103P- CC ⁴ |
| 3-way/single-pole 120V 600W | DVCL-153P- CC ³ |
| 3-way/single-pole 120V 600W | DVSCCL-153P- CC ⁴ |

Refer to the “how to calculate wattage when mixing lamp types” table on, www.lutron.com/dimcflled, when using a combination of bulb types with the C•L™ dimmer.

eco-dim® dimmer with locator light

| | |
|--------------------------------|----------------------------------|
| 3-way/single-pole 120V 600W | DV-603PG- EE ² |
|--------------------------------|----------------------------------|

eco-dim model guarantees at least 15% energy savings compared to a standard switch.

Dimmable CFL bulbs (screw-base)

Dimmable LED bulbs (screw-base)

Dimmers

| | |
|--------------------------------|-------------------------------------|
| 3-way/single-pole 120V 150W | DVCL-153P- CC ³ |
| 3-way/single-pole 120V 150W | DVSCCL-153P- CC ⁴ |

Refer to the “how to calculate wattage when mixing lamp types” table on, www.lutron.com/dimcflled, when using a combination of bulb types with the C•L dimmer.

Visit www.lutron.com for an approved list of dimmable CFL/LED bulbs.

Magnetic low-voltage dimmers

Dimmers

| | |
|-------------------------------------|--|
| Single-pole 120V 600 VA (450 W) | DVLV-600P- CC ³ DVSCLV-600P- CC ⁴ |
| Single-pole 120V 1000 VA (800 W) | DVLV-10P- CC ³ DVSCLV-10P- CC ⁴ |
| 3-way 120V 600 VA (450 W) | DVLV-603P- CC ³ DVSCLV-603P- CC ⁴ |
| 3-way 120V 1000 VA (800 W) | DVLV-103P- CC ³ DVSCLV-103P- CC ⁴ |

The stated VA (Volt-Ampere) rating includes the magnetic transformer heat losses and the lamp load. The stated W (Watt) rating is the maximum lamp wattage based on assumed 20% transformer loss.

CC³: Gloss color codes, see pg. 87

CC⁴: Satin color codes, see pg. 87

EE²: Available in White (WH), Ivory (IV), Almond (AL) and Light Almond (LA)

(Wallplates not included with above, order separately, see pg. 160)

All models must be derated if ganged unless otherwise noted, see pg. 170.

LUTRON SINGLE POLE SWITCH

[RELATED SECTIONS 26 09 33]

Model Number: CA-1PSH [-WH, -GR]

Location: Interior White Walls [-WH], Interior White Walls [-GR]

Dimensions:

Width: 3"

Height: 4-3/4"

Depth: 1/2"

Finish: White, Gray

Features:

Control Type: Rocker

Source Type: Incandescent, Halogen, Magnetic Low Voltage,
Electronic Low Voltage, Fluorescent, LED

Electrical:

Wattage:

Voltage: 120

Load Rating: 120/277 VAC, 60 Hz

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$4.14



Field customizable 6-port frame



- Shipped with six blanks in matching colors
- Connectors and wallplate sold separately
- Connectors snap in (no tools required)
- Connectors available in White (WH), unless noted

| | |
|---------------|--|
| 6-port frame* | CA-6PF- CC ³ SC-6PF- CC ⁴ |
|---------------|--|

Connectors for 6-port frame

Telephone/network jacks



| | |
|------------------------------|-----------------------------------|
| 8-conductor, RJ45 category 3 | CON-1P-C3- EE ⁴ |
|------------------------------|-----------------------------------|

| | |
|-------------------------------|------------------------------------|
| 8-conductor, RJ45 category 5e | CON-1P-C5E- EE ⁴ |
|-------------------------------|------------------------------------|

| | |
|------------------------------|-----------------------------------|
| 8-conductor, RJ45 category 6 | CON-1P-C6- EE ⁴ |
|------------------------------|-----------------------------------|

Fiber jacks



| | |
|--------------------|----------------|
| MT-RJ feed through | CON-1F-MTRJ-WH |
|--------------------|----------------|



| | |
|------------|--------------|
| SC simplex | CON-1F-SC-WH |
|------------|--------------|



| | |
|--------------------|--------------|
| LC non-flush mount | CON-1F-LC-WH |
|--------------------|--------------|



| | |
|----------|--------------|
| ST style | CON-1F-ST-WH |
|----------|--------------|

Cable jack



| | |
|-------------------------------|--------------------------------|
| F-style, 75-Ohm coaxial cable | CON-1C- EE ⁴ |
|-------------------------------|--------------------------------|

BNC jack



| | |
|-----------------------|-----------|
| BNC connector, 50-Ohm | CON-1B-WH |
|-----------------------|-----------|

Connectors only for use with 6-port frame.

Switches



- Paddle turns on/off
- Use with any 15A load
- General purpose switching of all sources and motor loads
- No derating if ganged

General purpose switches (120/277 V)

| | | |
|-------------|------|---|
| Single-pole | 15A* | CA-1PSH- CC ³ SC-1PS- CC ⁴ |
| 3-way | 15A* | CA-3PSH- CC ³ SC-3PS- CC ⁴ |
| 4-way | 15A* | CA-4PSH- CC ³ SC-4PS- CC ⁴ |

General purpose switch with locator light (120 V only)

| | | |
|-------------|------|---|
| Single-pole | 15A* | CA-1PSNL- EE ² SC-1PSNL- EE ¹⁰ |
| 3-way | 15A* | CA-3PSNL- EE ² SC-3PSNL- EE ¹⁰ |
| 4-way | 15A* | CA-4PSNL- EE ² SC-4PSNL- EE ¹⁰ |

CC³: Gloss color codes, see pg. 161

CC⁴: Satin color codes, see pg. 161

EE²: Only available in Almond (AL), Ivory (IV), Light Almond (LA) and White (WH)

EE⁴: Only available in White (WH) and Black (BL)

EE¹⁰: Available in Biscuit (BI), Eggshell (ES), Goldstone (GS), Limestone (LS), Sea Glass (SG) and Snow (SW)

*Stainless Steel finish only available as separate wallplate. Match with separate Black (BL) or Midnight (MN) controls and accessories.

LUTRON THREE WAY SWITCH

[RELATED SECTIONS 26 09 33]

Model Number: CA-3PSH

Location: interior white walls [-WH], Main House wooden surfaces [-GR]

Dimensions:

Width: 3"

Height: 4-3/4"

Depth: 1/2"

Finish: white [-WR], gray [-GR]

Features:

Three Way Switch

Built in soft glow and night light

Power failure memory

RFI Suppression

UV Stable color

Control Type: Rocker

Source Type: Magnetic Low Voltage

Electrical:

Voltage: 120 V

Load Rating: 120/277 VAC, 60 Hz

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$5.27



Field customizable 6-port frame



- Shipped with six blanks in matching colors
- Connectors and wallplate sold separately
- Connectors snap in (no tools required)
- Connectors available in White (WH), unless noted

| | |
|---------------|--|
| 6-port frame* | CA-6PF- CC ³ SC-6PF- CC ⁴ |
|---------------|--|

Connectors for 6-port frame

Telephone/network jacks



| | |
|-------------------------------|------------------------------------|
| 8-conductor, RJ45 category 3 | CON-1P-C3- EE ⁴ |
| 8-conductor, RJ45 category 5e | CON-1P-C5E- EE ⁴ |
| 8-conductor, RJ45 category 6 | CON-1P-C6- EE ⁴ |

Fiber jacks



| | |
|--------------------|----------------|
| MT-RJ feed through | CON-1F-MTRJ-WH |
| SC simplex | CON-1F-SC-WH |
| LC non-flush mount | CON-1F-LC-WH |
| ST style | CON-1F-ST-WH |

Cable jack



| | |
|-------------------------------|--------------------------------|
| F-style, 75-Ohm coaxial cable | CON-1C- EE ⁴ |
|-------------------------------|--------------------------------|

BNC jack



| | |
|-----------------------|-----------|
| BNC connector, 50-Ohm | CON-1B-WH |
|-----------------------|-----------|

Connectors only for use with 6-port frame.

Switches



- Paddle turns on/off
- Use with any 15A load
- General purpose switching of all sources and motor loads
- No derating if ganged

General purpose switches (120/277 V)

| | | |
|-------------|------|---|
| Single-pole | 15A* | CA-1PSH- CC ³ SC-1PS- CC ⁴ |
| 3-way | 15A* | CA-3PSH- CC ³ SC-3PS- CC ⁴ |
| 4-way | 15A* | CA-4PSH- CC ³ SC-4PS- CC ⁴ |

General purpose switch with locator light (120 V only)

| | | |
|-------------|------|---|
| Single-pole | 15A* | CA-1PSNL- EE ² SC-1PSNL- EE ¹⁰ |
| 3-way | 15A* | CA-3PSNL- EE ² SC-3PSNL- EE ¹⁰ |
| 4-way | 15A* | CA-4PSNL- EE ² SC-4PSNL- EE ¹⁰ |

CC³: Gloss color codes, see pg. 161

CC⁴: Satin color codes, see pg. 161

EE²: Only available in Almond (AL), Ivory (IV), Light Almond (LA) and White (WH)

EE⁴: Only available in White (WH) and Black (BL)

EE¹⁰: Available in Biscuit (BI), Eggshell (ES), Goldstone (GS), Limestone (LS), Sea Glass (SG) and Snow (SW)

*Stainless Steel finish only available as separate wallplate. Match with separate Black (BL) or Midnight (MN) controls and accessories.

LUTRON THREE WAY SWITCH

[RELATED SECTIONS 26 09 33]

Model Number: DVLV-603P-GR

Location: interior white walls [-WH], Main House wooden surfaces [-GR]

Dimensions:

Width: 3"

Height: 4-3/4"

Depth: 1/2"

Finish: white [-WR], gray [-GR]

Features:

Three Way Switch

Built in soft glow and night light

Power failure memory

RFI Suppression

UV Stable color

Control Type: Rocker

Source Type: Magnetic Low Voltage

Electrical:

Voltage: 120 V

Load Rating: 120/277 VAC, 60 Hz

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$4.66



Field customizable 6-port frame




- Shipped with six blanks in matching colors
- Connectors and wallplate sold separately
- Connectors snap in (no tools required)
- Connectors available in White (WH), unless noted





| | |
|---------------|--------------------------------|
| 6-port frame* | CA-6PF- CC ³ |
| | SC-6PF- CC ⁴ |

Connectors for 6-port frame


Telephone/network jacks

| | |
|--|------------------------------------|
|  8-conductor, RJ45 category 3 | CON-1P-C3- EE ⁴ |
| 8-conductor, RJ45 category 5e | CON-1P-C5E- EE ⁴ |
| 8-conductor, RJ45 category 6 | CON-1P-C6- EE ⁴ |


Fiber jacks

| | |
|--|----------------|
|  MT-RJ feed through | CON-1F-MTRJ-WH |
|  SC simplex | CON-1F-SC-WH |
|  LC non-flush mount | CON-1F-LC-WH |
|  ST style | CON-1F-ST-WH |

Cable jack

| | |
|---|--------------------------------|
|  F-style, 75-Ohm coaxial cable | CON-1C- EE ⁴ |
|---|--------------------------------|

BNC jack

| | |
|---|-----------|
|  BNC connector, 50-Ohm | CON-1B-WH |
|---|-----------|

Connectors only for use with 6-port frame.

Switches



- Paddle turns on/off
- Use with any 15A load
- General purpose switching of all sources and motor loads
- No derating if ganged

General purpose switches (120/277 V)

| | | |
|-------------|------|---|
| Single-pole | 15A* | CA-1PSH- CC ³ SC-1PS- CC ⁴ |
| 3-way | 15A* | CA-3PSH- CC ³ SC-3PS- CC ⁴ |
| 4-way | 15A* | CA-4PSH- CC ³ SC-4PS- CC ⁴ |

General purpose switch with locator light (120V only)

| | | |
|-------------|------|---|
| Single-pole | 15A* | CA-1PSNL- EE ² SC-1PSNL- EE ¹⁰ |
| 3-way | 15A* | CA-3PSNL- EE ² SC-3PSNL- EE ¹⁰ |
| 4-way | 15A* | CA-4PSNL- EE ² SC-4PSNL- EE ¹⁰ |

CC³: Gloss color codes, see pg. 161

CC⁴: Satin color codes, see pg. 161

EE²: Only available in Almond (AL), Ivory (IV), Light Almond (LA) and White (WH)

EE⁴: Only available in White (WH) and Black (BL)

EE¹⁰: Available in Biscuit (BI), Eggshell (ES), Goldstone (GS), Limestone (LS), Sea Glass (SG) and Snow (SW)

*Stainless Steel finish only available as separate wallplate. Match with separate Black (BL) or Midnight (MN) controls and accessories.

LUTRON 1 GANG WALL PLATE

[RELATED SECTION 29 09 33]

[RELATED SECTION 26 30 00]

Model Number: CW-1 [-WH, -GR]

Location: Interior White Walls [-WH], Interior Gray Walls [-GR]

Dimensions:

Width: 3"

Height: 4-3/4"

Depth: 1/2"

Finish: White gloss, Gray gloss

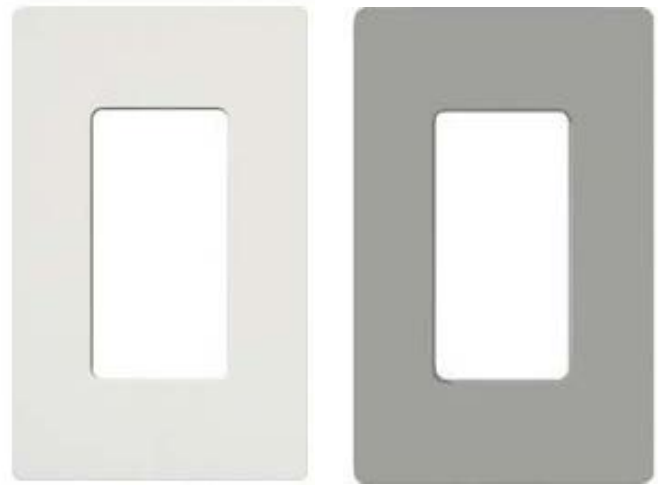
Features:

1 Gang

No Visible Hardware

Available: Lowes

Price: \$2.89



Wallplates for Maestro®, Maestro IR®, Maestro Wireless®, Pico™ wireless control, Spacer System®, Diva®, Lyneo® Lx, Skylark® and Skylark Contour™



1-gang* CW-1-**CC**²
SC-1-**CC**⁴
W: 2.94 in (75 mm); H: 4.69 in (119 mm)
D: .30 in (7.6 mm)



4-gang* CW-4-**CC**²
SC-4-**CC**⁴
W: 8.37 in (213 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



2-gang* CW-2-**CC**²
SC-2-**CC**⁴
W: 4.75 in (121 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



5-gang* CW-5-**CC**²
SC-5-**CC**⁴
W: 10.18 in (259 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



3-gang* CW-3-**CC**²
SC-3-**CC**⁴
W: 6.56 in (167 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)

Multiple devices with line and low-voltage can be mounted behind a common wallplate using a standard barrier backbox, see Application Note #213 (Combining Low-Voltage and Line Voltage Wiring Devices in a Multi-Gang Box) at www.lutron.com/applicationnotes.

CC²: Gloss and Stainless Steel color codes, see pg. 161
CC⁴: Satin color codes, see pg. 161

Multi-gang dimmer installations may require derating, see pg. 170.

*Stainless Steel finish wallplates include black plastic trim/adaptor, visible from side. Match with separate Black (BL) or Midnight (MN) controls and accessories.

LUTRON 2 GANG WALL PLATE

[RELATED SECTION 29 09 33]

[RELATED SECTION 26 30 00]

Model Number: CW-2-WH

Location: White Interior Walls

Dimensions:

Width: 4-3/4"

Height: 4-3/4"

Depth: 1/2"

Finish: White gloss

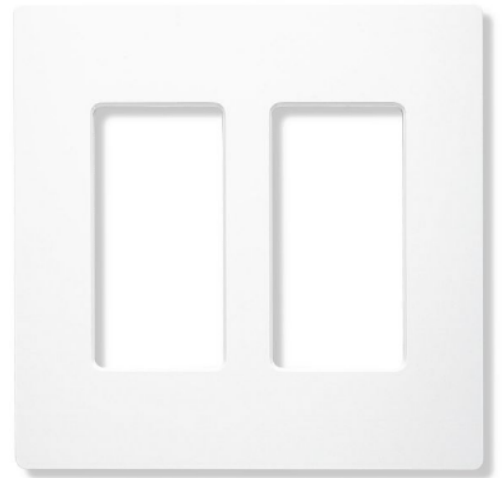
Features:

2 Gang

No Visible Hardware

Available: Lowes

Price: \$5.00



Wallplates for Maestro®, Maestro IR®, Maestro Wireless®, Pico™ wireless control, Spacer System®, Diva®, Lyneo® Lx, Skylark® and Skylark Contour™



1-gang* CW-1-**CC**²
SC-1-**CC**⁴
W: 2.94 in (75 mm); H: 4.69 in (119 mm)
D: .30 in (7.6 mm)



4-gang* CW-4-**CC**²
SC-4-**CC**⁴
W: 8.37 in (213 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



2-gang* CW-2-**CC**²
SC-2-**CC**⁴
W: 4.75 in (121 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



5-gang* CW-5-**CC**²
SC-5-**CC**⁴
W: 10.18 in (259 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



3-gang* CW-3-**CC**²
SC-3-**CC**⁴
W: 6.56 in (167 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)

Multiple devices with line and low-voltage can be mounted behind a common wallplate using a standard barrier backbox, see Application Note #213 (Combining Low-Voltage and Line Voltage Wiring Devices in a Multi-Gang Box) at www.lutron.com/applicationnotes.

CC²: Gloss and Stainless Steel color codes, see pg. 161
CC⁴: Satin color codes, see pg. 161

Multi-gang dimmer installations may require derating, see pg. 170.

*Stainless Steel finish wallplates include black plastic trim/adaptor, visible from side. Match with separate Black (BL) or Midnight (MN) controls and accessories.

LUTRON 3 GANG WALL PLATE

[RELATED SECTION 29 09 33]

[RELATED SECTION 26 30 00]

Model Number: CW-3-WH

Location: White Interior Walls

Dimensions:

Width: 4-3/4"

Height: 6-1/2"

Depth: 1/2"

Finish: White gloss

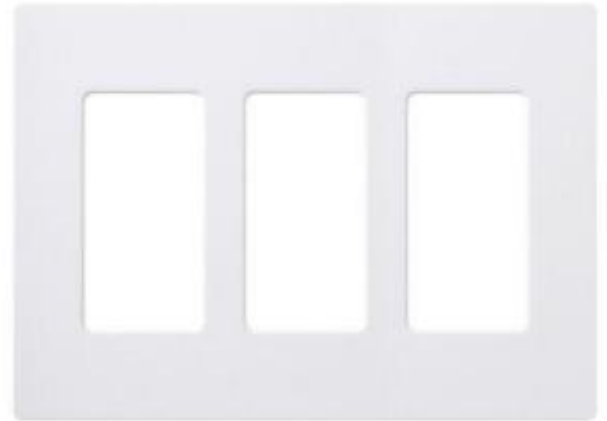
Features:

3 Gang

No Visible Hardware

Available: Lowes

Price: \$10.00



Wallplates for Maestro®, Maestro IR®, Maestro Wireless®, Pico™ wireless control, Spacer System®, Diva®, Lyneo® Lx, Skylark® and Skylark Contour™



1-gang* CW-1-**CC**²
SC-1-**CC**⁴
W: 2.94 in (75 mm); H: 4.69 in (119 mm)
D: .30 in (7.6 mm)



4-gang* CW-4-**CC**²
SC-4-**CC**⁴
W: 8.37 in (213 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



2-gang* CW-2-**CC**²
SC-2-**CC**⁴
W: 4.75 in (121 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



5-gang* CW-5-**CC**²
SC-5-**CC**⁴
W: 10.18 in (259 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



3-gang* CW-3-**CC**²
SC-3-**CC**⁴
W: 6.56 in (167 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)

Multiple devices with line and low-voltage can be mounted behind a common wallplate using a standard barrier backbox, see Application Note #213 (Combining Low-Voltage and Line Voltage Wiring Devices in a Multi-Gang Box) at www.lutron.com/applicationnotes.

CC²: Gloss and Stainless Steel color codes, see pg. 161
CC⁴: Satin color codes, see pg. 161

Multi-gang dimmer installations may require derating, see pg. 170.

*Stainless Steel finish wallplates include black plastic trim/adaptor, visible from side. Match with separate Black (BL) or Midnight (MN) controls and accessories.

LUTRON 4 GANG WALL PLATE

[RELATED SECTION 29 09 33]

[RELATED SECTION 26 30 00]

Model Number: CW-4-WH

Location: White Interior Walls

Dimensions:

Width: 4-3/4"

Height: 6-1/2"

Depth: 1/2"

Finish: White gloss

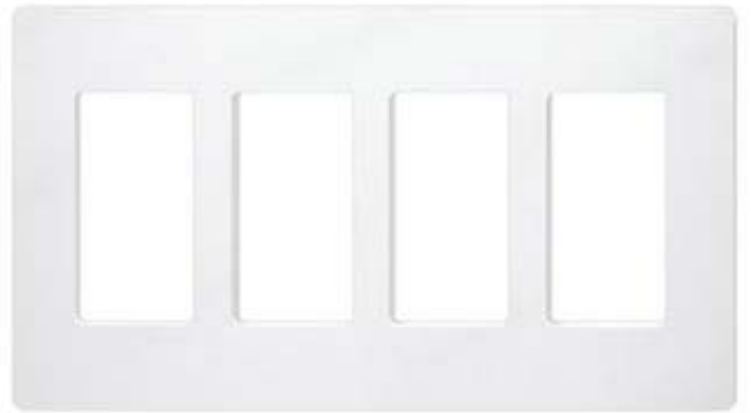
Features:

4 Gang

No Visible Hardware

Available: Lowes

Price: \$13.33



Wallplates for Maestro®, Maestro IR®, Maestro Wireless®, Pico™ wireless control, Spacer System®, Diva®, Lyneo® Lx, Skylark® and Skylark Contour™



1-gang*

CW-1-**CC**²
SC-1-**CC**⁴

W: 2.94 in (75 mm); H: 4.69 in (119 mm)
D: .30 in (7.6 mm)



4-gang*

CW-4-**CC**²
SC-4-**CC**⁴

W: 8.37 in (213 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



2-gang*

CW-2-**CC**²
SC-2-**CC**⁴

W: 4.75 in (121 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



5-gang*

CW-5-**CC**²
SC-5-**CC**⁴

W: 10.18 in (259 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)



3-gang*

CW-3-**CC**²
SC-3-**CC**⁴

W: 6.56 in (167 mm); H: 4.69 in (119 mm);
D: .30 in (7.6 mm)

Multiple devices with line and low-voltage can be mounted behind a common wallplate using a standard barrier backbox, see Application Note #213 (Combining Low-Voltage and Line Voltage Wiring Devices in a Multi-Gang Box) at www.lutron.com/applicationnotes.

CC²: Gloss and Stainless Steel color codes, see pg. 161
CC⁴: Satin color codes, see pg. 161

Multi-gang dimmer installations may require derating, see pg. 170.

*Stainless Steel finish wallplates include black plastic trim/adaptor, visible from side. Match with separate Black (BL) or Midnight (MN) controls and accessories.

ELEMENTAL LED DIMMABLE DRIVER

[RELATED SECTION 26 22 16]

Model Number: EL-20WDIM

Location: throughout The Solar Homestead

Dimensions:

Length: 5-1/2"

Width: 2"

Height: 1-1/2"

Electrical:

Wattage: 20 W

Approval Certificates:

UL Listed

Available: Elemental LED





12V Dimmable Driver

EL-TMDRVR

UL Recognized Component, E164279 (20W, 60W, 200W):
 Electrical Insulation Component

ETL Listed (100W)

Compatible with: 120V AC magnetic
 low voltage dimmers

Minimum load: none

Insulation System Temp Class: 266°F / 130°C (B)

Working Temp.: < 149°F / 65°C
 (104°F / 40°C ambient temp.)



The 12V Dimmable Driver is a steady low voltage power driver perfect for supplying dimmable LED lights. Have you been searching everywhere for a way to dim your LED lights without flickering and using a household dimmer switch? Look no further. This 12V DC transformer—which is available in 20W, 60W, and 200W versions—can be used to power any of our dimmable LED lights, and allows you to install our low voltage LED light fixtures while using a common 120V magnetic low voltage dimmer. There's no need to rewire your kitchen cabinets or living room lights, just tap into the high voltage AC power near where you intend to install your energy-efficient LED product.

12V Dimmable Drivers can be dimmed with a standard AC magnetic low voltage dimmer, with no external fusing required. This DC driver is designed for high voltage AC dimmer switches that are rated for use with magnetic low voltage loads or that are stated to have symmetric forward phase control. This driver is not compatible with our 12V Inline Dimmer Switch, which is a 12V DC electronic low voltage dimmer, and will not work with other switches rated for electronic low voltage power, and is not for use with incandescent dimmers that do not carry the magnetic low voltage or symmetric forward phase control ratings.

The following Lutron brand 120V dimmer switches are compatible with our Dimmable Drivers: Ariadni (model #AYLV-600P), Diva (#DVSCLV-600P), Glyder (#600V), Skylark (#SLV-600-P), Vareo (#V-600). Lower wattage LED installations, such as one that would require the 20W Dimmable Driver, may require a specific model of dimmer.

And this power supply's transformer has a sturdy aluminum housing, for protection against the elements. Just loosen the screw on one side of the driver to separate the two sections, then connect its wires to your household AC wires through the two knock-outs at the end of the housing. The driver comes with full instructions, safety guidelines, and wiring diagrams, so installation is simple.

For optimum performance, do not load the power supply to more than 80% of its labeled rating.



60W / 100W / 200W



20W



60W

| wattage | SKU | weight | dimensions | input | output | frequency | protection rating |
|---------|------------|--------------|---------------------------------|---------|--------|-----------|-------------------|
| 20W | EL-20WDIM | 1 lb. 8 oz. | L=5.6 in., W=2 in., D=1.45 in. | 120V AC | 12V DC | 60 Hz | IP30 |
| 60W | EL-60WDIM | 4 lb. 1 oz. | L=8.4 in., W=3.1 in., D=2.9 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |
| 100W | EL-100WDIM | 5 lb. 12 oz. | L=9 in., W=3 in., D=3 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |
| 200W | EL-200WDIM | 6 lb. 5 oz. | L=9 in., W=4.2 in., D=3.25 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |

ELEMENTAL LED DIMMABLE DRIVER

[RELATED SECTION 26 22 16]

Model Number: EL-60WDIM

Location: throughout The Solar Homestead

Dimensions:

Length: 8-1/2"

Width: 3"

Height: 3"

Electrical:

Wattage: 60 W

Approval Certificates:

UL Listed

Available: Elemental LED





12V Dimmable Driver

EL-TMDRVR

UL Recognized Component, E164279 (20W, 60W, 200W):
 Electrical Insulation Component

ETL Listed (100W)

Compatible with: 120V AC magnetic
 low voltage dimmers

Minimum load: none

Insulation System Temp Class: 266°F / 130°C (B)

Working Temp.: < 149°F / 65°C
 (104°F / 40°C ambient temp.)



The 12V Dimmable Driver is a steady low voltage power driver perfect for supplying dimmable LED lights. Have you been searching everywhere for a way to dim your LED lights without flickering and using a household dimmer switch? Look no further. This 12V DC transformer—which is available in 20W, 60W, and 200W versions—can be used to power any of our dimmable LED lights, and allows you to install our low voltage LED light fixtures while using a common 120V magnetic low voltage dimmer. There's no need to rewire your kitchen cabinets or living room lights, just tap into the high voltage AC power near where you intend to install your energy-efficient LED product.

12V Dimmable Drivers can be dimmed with a standard AC magnetic low voltage dimmer, with no external fusing required. This DC driver is designed for high voltage AC dimmer switches that are rated for use with magnetic low voltage loads or that are stated to have symmetric forward phase control. This driver is not compatible with our 12V Inline Dimmer Switch, which is a 12V DC electronic low voltage dimmer, and will not work with other switches rated for electronic low voltage power, and is not for use with incandescent dimmers that do not carry the magnetic low voltage or symmetric forward phase control ratings.

The following Lutron brand 120V dimmer switches are compatible with our Dimmable Drivers: Ariadni (model #AYLV-600P), Diva (#DVSCLV-600P), Glyder (#600V), Skylark (#SLV-600-P), Vareo (#V-600). Lower wattage LED installations, such as one that would require the 20W Dimmable Driver, may require a specific model of dimmer.

And this power supply's transformer has a sturdy aluminum housing, for protection against the elements. Just loosen the screw on one side of the driver to separate the two sections, then connect its wires to your household AC wires through the two knock-outs at the end of the housing. The driver comes with full instructions, safety guidelines, and wiring diagrams, so installation is simple.

For optimum performance, do not load the power supply to more than 80% of its labeled rating.



60W / 100W / 200W



20W



60W

| wattage | SKU | weight | dimensions | input | output | frequency | protection rating |
|---------|------------|--------------|---------------------------------|---------|--------|-----------|-------------------|
| 20W | EL-20WDIM | 1 lb. 8 oz. | L=5.6 in., W=2 in., D=1.45 in. | 120V AC | 12V DC | 60 Hz | IP30 |
| 60W | EL-60WDIM | 4 lb. 1 oz. | L=8.4 in., W=3.1 in., D=2.9 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |
| 100W | EL-100WDIM | 5 lb. 12 oz. | L=9 in., W=3 in., D=3 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |
| 200W | EL-200WDIM | 6 lb. 5 oz. | L=9 in., W=4.2 in., D=3.25 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |

ELEMENTAL LED DIMMABLE DRIVER

[RELATED SECTION 26 22 16]

Model Number: EL-100WDIM

Location: throughout The Solar Homestead

Dimensions:

Length: 9"

Width: 3"

Height: 3"

Electrical:

Wattage: 100 W

Approval Certificates:

UL Listed

Available: Elemental LED





12V Dimmable Driver

EL-TMDRVR

UL Recognized Component, E164279 (20W, 60W, 200W):
 Electrical Insulation Component

ETL Listed (100W)

Compatible with: 120V AC magnetic
 low voltage dimmers

Minimum load: none

Insulation System Temp Class: 266°F / 130°C (B)

Working Temp.: < 149°F / 65°C
 (104°F / 40°C ambient temp.)



The 12V Dimmable Driver is a steady low voltage power driver perfect for supplying dimmable LED lights. Have you been searching everywhere for a way to dim your LED lights without flickering and using a household dimmer switch? Look no further. This 12V DC transformer—which is available in 20W, 60W, and 200W versions—can be used to power any of our dimmable LED lights, and allows you to install our low voltage LED light fixtures while using a common 120V magnetic low voltage dimmer. There's no need to rewire your kitchen cabinets or living room lights, just tap into the high voltage AC power near where you intend to install your energy-efficient LED product.

12V Dimmable Drivers can be dimmed with a standard AC magnetic low voltage dimmer, with no external fusing required. This DC driver is designed for high voltage AC dimmer switches that are rated for use with magnetic low voltage loads or that are stated to have symmetric forward phase control. This driver is not compatible with our 12V Inline Dimmer Switch, which is a 12V DC electronic low voltage dimmer, and will not work with other switches rated for electronic low voltage power, and is not for use with incandescent dimmers that do not carry the magnetic low voltage or symmetric forward phase control ratings.

The following Lutron brand 120V dimmer switches are compatible with our Dimmable Drivers: Ariadni (model #AYLV-600P), Diva (#DVSCLV-600P), Glyder (#600V), Skylark (#SLV-600-P), Vareo (#V-600). Lower wattage LED installations, such as one that would require the 20W Dimmable Driver, may require a specific model of dimmer.

And this power supply's transformer has a sturdy aluminum housing, for protection against the elements. Just loosen the screw on one side of the driver to separate the two sections, then connect its wires to your household AC wires through the two knock-outs at the end of the housing. The driver comes with full instructions, safety guidelines, and wiring diagrams, so installation is simple.

For optimum performance, do not load the power supply to more than 80% of its labeled rating.



60W / 100W / 200W



20W



60W

| wattage | SKU | weight | dimensions | input | output | frequency | protection rating |
|---------|------------|--------------|---------------------------------|---------|--------|-----------|-------------------|
| 20W | EL-20WDIM | 1 lb. 8 oz. | L=5.6 in., W=2 in., D=1.45 in. | 120V AC | 12V DC | 60 Hz | IP30 |
| 60W | EL-60WDIM | 4 lb. 1 oz. | L=8.4 in., W=3.1 in., D=2.9 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |
| 100W | EL-100WDIM | 5 lb. 12 oz. | L=9 in., W=3 in., D=3 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |
| 200W | EL-200WDIM | 6 lb. 5 oz. | L=9 in., W=4.2 in., D=3.25 in. | 120V AC | 12V DC | 60 Hz | IP32 / Nema 3R |

ELEMENTAL LED NON-DIMMABLE DRIVER**[RELATED SECTION 26 22 16]**

Model Number: EL-12VDRVR

Location: throughout The Solar Homestead

Dimensions:

Length: 6-1/2"

Width: 1-1/8"

Height: 1-3/4"

Features:

Input voltage: 100V-240 Vac

Input current: 0.55 A

Output voltage: 12 Vdc

Electrical:

Wattage: 60 W

Voltage: 1.67 A

Approval Certificates:

UL Listed

Available: Elemental LED





12V Driver

EL-12VDRVR

UL Listed

Lead Wires Length (20/35/60W): 22 in.

Lead Wires Length (150/200W): 11 in.

For optimum performance, do not load the power supply to more than 80% of its labeled rating.



Elemental's 12V Driver provides the steady voltage and high efficiency needed to get the most from LED lights. All our 12V LED drivers are energy-efficient, eco-friendly. Also, our 20W, 35W, and 60W drivers have an IP rating of IP67, which means that they're water resistant and wet location rated, perfect for outdoor use, but it can also be used indoors. The 150W, 200W, 300W and 600W drivers are designed to be used either in a clean, dry environment indoors or to be placed in an enclosure provided by the end user if the driver is used in harsher environments. Our 12V LED power driver is highly efficient and provides extremely steady voltage, so no more flickering lights. All of the LED drivers are solid state, which means they do not have any moving parts, will last longer than a switching power adapter, and draw power only when the attached LED light fixtures are turned on, which eliminates phantom energy consumption.

- Outdoor drivers (which are also for use indoors) are available in these wattages: 20W, 35W, and 60W
- Indoor drivers are available in these wattages: 150W, 200W, 300W and 600W

If you're working with a permanent low voltage LED lighting installation, it's vital to use a Power Driver that provides a steady current. The Driver/transformer is a hard-wired power source for your indoor LED lights that is typically placed inside a wall or ceiling, in the attic or under the house, but is also compact enough to tuck into a corner. Think about using this outdoor LED driver near a pool or hot tub, with a water feature, in a garden or as part of landscaping, in a greenhouse, or anywhere your lighting setup will be exposed to moisture and the elements.

Our 12V DC Drivers are compatible with electrical systems from 100V to 240V AC, with frequencies of both 60 Hz (North and Central America) and 50 Hz (the rest of the world). Like all our products, these 12V drivers are RoHS (Restriction of Hazardous Substances) certified.

For optimum performance, we recommend you do not load the power supply to more than 80% of its labeled rating. So a 60W driver should power only 48 Watts of LED lighting.



20W / 35W / 60W
Outdoor / Indoor Drivers



150W / 200W
Indoor Drivers



300W / 600W
Indoor Drivers

| wattage | weight | dimensions (in.) | input voltage | input amps (120V) | output voltage | frequency | current | IP rating |
|---------|--------------|----------------------|----------------|-------------------|----------------|-----------|---------|-----------|
| 20W | 6 oz. | W=1.2, L=5.1, H=1 | 100V - 240V AC | 0.55A | 12V DC | 50/60 Hz | 1.67A | IP67 |
| 35W | 13 oz. | W=1.5, L=5.8, H=1.2 | 100V - 240V AC | 1.1A | 12V DC | 50/60 Hz | 3A | IP67 |
| 60W | 22 oz. | W=1.1, L=6.4, H=1.7 | 100V - 240V AC | 1.2A | 12V DC | 50/60 Hz | 5A | IP67 |
| 150W | 1 lb. 9 oz. | W=4, L=7.9, H=2 | 85-264V AC | 2.5A | 12V DC | 50/60 Hz | 12.5A | indoor |
| 200W | 1 lb. 11 oz. | W=4, L=7.9, H=2 | 85-264V AC | 3.5A | 12V DC | 50/60 Hz | 16.7A | indoor |
| 300W | 2.1 lbs. | W=4.2, L=8.5, D=1.75 | 85-264V AC | 5A | 12V DC | 50/60 Hz | 27A | indoor |
| 600W | 3.3 lbs. | W=4.1, L=8.6, D=2.5 | 85-264V AC | 8.5A | 12V DC | 50/60 Hz | 53A | indoor |

EATON CUTLER HAMMER METER COMBO

[RELATED SECTION 26 24 16]

Model Number: CMB2436B200BTS

Location: Electrical Closet

Dimensions:

Width: 14-7/16" [367 mm]

Height: 32-3/8" [823 mm]

Depth: 5-3/8" [137 mm]

Features:

Jaws: 4

Distribution: 24/36

Ringless All-In-One

Main Breaker: CSH2200

Electrical:

Current: 200 A

Approval Certificates:

UL Safety Approval

Available: Lowes

Price: \$144.00





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Eaton Cutler-Hammer 200-Amp Ringless Meter Socket

Item #: 112737 | Model #: MBE4040B200BTS

★★★★★ Be the first to write a review!

\$144.00

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Eaton Cutler-Hammer 200 Amp, 4 Spaces, 8...

Not Yet Rated

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| | | | |
|-----------------------------|-------|--------------------|------------------------|
| Amps (Amps) | 200.0 | ETL Safety Listing | No |
| Feed-Through Lugs | No | Feed Type | Overhead/Underground |
| Number of Meter Positions | 40.0 | Phase Type | Single phase (120/240) |
| Meter Socket Depth (Inches) | 6.75 | Meter Socket Type | Ringless |
| Length (Inches) | 34.08 | Orientation | Over/Under |
| Meter Socket Width (Inches) | 23.25 | Jaw Quantity | 4.0 |
| Meets EUSERC Requirements | No | Pedestal | Yes |
| UL Safety Listing | Yes | Bypass Type | None |
| CSA Safety Listing | No | Cover Type | Semi-flush |

[RELATED SECTION 26 24 16]

Model Number: HOM3040M150VP

Location: North Hall

Dimensions:

Width: 16"

Height: 35-7/8"

Depth: 5-3/8"

Finish: Gray

Features:

Service entrance or sub panel

Over/under orientation

Aluminum buss bar construction

Number of spaces: 30

Circuits: 40

Electrical:

Current: 150 A

Approval Certificates:

UL Listed

Available: Lowes

Price: \$134.00





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Main Breaker Load Center



Square D 430-Space 150-Amp Main Breaker Load Center

Item #: 286868 | Model #:HOM3040M150VP

★★★★★ Be the first to write a review!

\$134.00

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[Specifications](#)

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Indoor/Outdoor

Indoor

Value Pack

Yes

Service Type

Service entrance or sub panel

Value Pack Contents

1 - HOM3040M150C Homeline 150 A 30 Space 40 Circuit Main Breaker Load Center, 3 - Single Pole 20 A Circuit Breakers, 1 - Double Pole 30 A Circuit Breaker

Orientation

Over/Under

Ground Bar Installed

No

Buss Bar Construction

Aluminum

Panel Color

Gray

Load Center Depth (Inches)

35.9

Load Center Height (Inches)

5.4

Load Center Width (Inches)

16.0

Cover Included

Yes

Paintable

No

All-in-One/Combination

No

UL Safety Listing

Yes

CSA Safety Listing

No

ETL Safety Listing

No

Main Breaker or Main Lug

Main breaker

Amps (Amps)

150.0

Number of Spaces

30.0

Circuits

40.0

Feed-Through Lugs

No

Load Center Mounting Type

Surface

Phase Type

Single phase (124/240)

ROMEX SIMPULL NM-B

[RELATED SECTION 26 27 26]



Model Number: NM-B

Location: throughout The Solar Homestead

Features:

Gauges vary: 12, 14, 10, 8, and 6 AWG

Number of conductors: 3 for all gauges

Electrical:

Voltage: 600 V

Current: varies between 15, 20, 30, 40, and 55 A

Approval Certificates:

UL Listed

Available: Lowes

Romex SIMpull®

Type NM-B

Nonmetallic-Sheathed Cable. 600 Volt.
Copper Conductors. Color-Coded Jacket.
Four Conductor Available With Two Neutrals.
SIM Jacket® Designed for Easier Pulling.



APPLICATIONS

Southwire's Romex SIMpull® Type NM-B (nonmetallic-sheathed cable) may be used for both exposed and concealed work in normally dry locations at temperatures not to exceed 90°C (with ampacity limited to that for 60°C conductors) as specified in the National Electrical Code¹. NM-B cable is primarily used in residential wiring as branch circuits for outlets, switches, and other loads. NM-B cable may be run in air voids of masonry block or tile walls where such walls are not wet or damp locations. Voltage rating for NM-B cable is 600 volts.

SPECIFICATIONS

Southwire's Romex SIMpull® Type NM-B cable meets or exceeds UL Standard 83, UL Standard 719, Federal Specification A-A-59544, and requirements of the National Electrical Code.

CONSTRUCTION

Southwire's Romex SIMpull® Type NM-B cable is manufactured as 2, 3, or 4 conductor cable, with a ground wire. Copper conductors are annealed (soft) copper. Stranded conductors are compressed stranded. Conductor insulation is 90°C-rated polyvinyl chloride (PVC), nylon jacketed. Southwire's SIMpull® Designed for Easier Pulling, Resulting in Easier installation. The cable jacket is color-coded for quick size identification; White - 14 AWG, Yellow - 12 AWG, Orange - 10 AWG, and Black - 8 AWG and 6 AWG.

¹ 2008 Edition

CU-NM-B

| Conductor | | | | Ground Wire | | Approx. Cable Dimension (mils) | Approx. Net Weight Per 1000' (lbs.) | Allowable Ampacity ⁺ | Standard Package |
|---|-------------------------|---------------------------|-----------------------------|-------------|-------------|--------------------------------|--|---------------------------------|------------------|
| Size (AWG) | No. Conductors in Cable | No. Strands in Conductors | Insulation Thickness (mils) | Size AWG | No. Strands | | | | |
| TWO CONDUCTOR | | | | | | | | | |
| 14 | 2 | 1 | 19 | 14 | 1 | 360 X 162 | 57 | 15 | EH |
| 12 | 2 | 1 | 19 | 12 | 1 | 410 X 179 | 82 | 20 | EH |
| 10 | 2 | 1 | 24 | 10 | 1 | 494 X 210 | 124 | 30 | EH |
| 8 | 2 | 1 | 35 | 10 | 1 | 612 X 269 | 186 | 40 | BK |
| 6 | 2 | 1 | 35 | 10 | 1 | 683 X 304 | 255 | 55 | BK |
| THREE CONDUCTOR | | | | | | | | | |
| 14 | 3 | 1 | 19 | 14 | 1 | 307 | 74 | 15 | BH |
| 12 | 3 | 1 | 19 | 12 | 1 | 347 | 107 | 20 | BH |
| 10 | 3 | 1 | 24 | 10 | 1 | 422 | 164 | 30 | BH |
| 8 | 3 | 7 | 35 | 10 | 1 | 565 | 253 | 40 | BK |
| 6 | 3 | 7 | 35 | 10 | 1 | 650 | 357 | 55 | BK |
| 4 | 3 | 7 | 46 | 8 | 1 | 814 | 560 | 70 | CK |
| 2 | 3 | 7 | 46 | 8 | 1 | 952 | 816 | 95 | CK |
| FOUR CONDUCTOR | | | | | | | | | |
| 14 | 2/2 | 1* | 19 | 14 | 1 | 336 | 91 | 15 | BH |
| 14 | 4 | 1** | 19 | 14 | 1 | 336 | 91 | 15 | BH |
| 12 | 2/2 | 1* | 19 | 12 | 1 | 381 | 132 | 20 | BH |
| 12 | 4 | 1** | 19 | 12 | 1 | 381 | 132 | 20 | BH |
| ⁺ Ampacity per 310.15 and 334.80, National Electrical Code, 2008 edition. NOTE: Jacket thickness for all NM-B cable is 30 mils. *Color Code for 2/2 Conductor Cable is Black, White, Red, and White with Red Stripe. **Color Code for 4 Conductor Cable is Black, White, Red, and Blue. | | | | | | | STANDARD PACKAGE CODE B - 1000' Reel C - 500' Reel E - 1000' Spool H - 250' Coil K - 125' Coil | | |

RECOMMENDED SAMPLE SPECIFICATIONS:

Conductors shall be UL-listed Type NM-B, suitable for operation at 600 volts in all installations as specified in the National Electrical Code. SIMpull[®] jacketed conductors shall be annealed copper as manufactured by Southwire Company or approved equal.

ROMEX SIMPULL THHN/THWN-2

[RELATED SECTION 26 27 26]



Model Number: THHN/THWN-2

Location: throughout The Solar Homestead

Features:

- Grounding wire uses 6 AWG, stranded 19

- Wire gauge varies between 6, 8, 10, 12, and 14 AWG

- Stranded 1 and 19

Electrical:

- Current: varies between 65, 50, 30, 15 A

Approval Certificates:

- UL Listed

Available: Lowes

SIMpull THHN®

600 Volts. Copper Conductor
 Thermoplastic Insulation/SIM Nylon Sheath¹
 Heat, Moisture, Gasoline, and Oil Resistant¹
 Also Rated MTW and THWN-2
 SIM Technology® for Easier Pulling



APPLICATIONS

Southwire SIMpull THHN® or THWN-2 conductors are primarily used in conduit and cable trays for services, feeders, and branch circuits in commercial or industrial applications as specified in the National Electrical Code. When used as Type THHN, or T90 Nylon conductor is suitable for use in dry locations at temperatures not to exceed 90 °C. When used as Type THWN-2 or TWN75, conductor is suitable for use in wet or dry locations at temperatures not to exceed 90 °C or not to exceed 75 °C when exposed to oil. When used as Type MTW, conductor is suitable for use in wet locations or when exposed to oil at temperatures not to exceed 60 °C or dry locations at temperatures not to exceed 90 °C (with ampacity limited to that for 75 °C conductor temperature per NFPA 79). Conductor temperatures not to exceed 105 °C in dry locations when rated AWM and used as appliance wiring material or when used as T90 Nylon. Voltage for all applications is 600 volts. This cable should be installed without application of pulling lubricant.

SPECIFICATIONS

Southwire SIMpull THHN® or THWN-2 or MTW (also AWM) meet or exceed:

- All applicable ASTM specifications
- UL Standard 83, 1581, and 1063(MTW)
- T90 Nylon/TWN75 sizes through 500 kcmil Standard C22.2 No. 75-08
- NOM-ANCE 90° C
- Federal Specification A-A-59544
- National Electrical Code, NFPA 70, 2011 Edition
- VW-1 - Sizes 14 through 1 AWG
- CT Use - UL 1685, Sizes 1/0 AWG and larger
- FT1 - Sizes through 500 kcmil
- RoHS/REACH Compliant
- Sunlight Resistant - Marked and listed in all colors sizes 2 AWG and larger
- NEMA WC 70 Construction Requirements

CONSTRUCTION

Southwire SIMpull THHN® or THWN-2 or MTW copper conductors are annealed (soft) copper, unilay compressed strand, insulated with a tough heat and moisture resistant polyvinyl chloride (PVC), over which a SIM (SLIKQWIK® Infused Membrane) nylon (polyamide) or UL Recognized equal jacket is applied. Available in black, white, red, blue, purple, green, yellow, brown, orange, and gray. Some colors standard, some subject to economic order quantity. THWN sizes 14 - 10 AWG. THWN-2 sizes 8 AWG and larger.

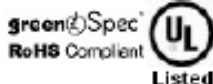
¹ Oil and gasoline resistant II as defined by Underwriters Laboratories.



Southwire
 One Southwire Drive
 Carrollton, Ga. 30119 USA



MADE
 IN THE
 USA



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¹Southwire is a registered trademark
 of Southwire Company.

SIMpull THHN

| Conductor | | Insulation Thickness (mils) | Jacket Thickness (mils) | Nominal O.D. (mils) | Approx. Net Weight Per 1000 ft. (lbs) | Allowable Ampacities + | | | Standard Package |
|---------------------|--------------|-----------------------------|-------------------------|---------------------|---------------------------------------|------------------------|-------|-------|------------------|
| Size (AWG or kcmil) | Num. Strands | | | | | 60 °C | 75 °C | 90 °C | |
| 14 | 1 | 15 | 4 | 102 | 15 | 15 | 15 | 15 | DNF |
| 12 | 1 | 15 | 4 | 119 | 23 | 20 | 20 | 20 | DQF |
| 10 | 1 | 20 | 4 | 150 | 36 | 20 | 20 | 30 | DNF |
| 14 | 19 | 15 | 4 | 109 | 16 | 15 | 15 | 15 | DNG |
| 12 | 19 | 15 | 4 | 128 | 24 | 20 | 20 | 20 | DQF |
| 10 | 19 | 20 | 4 | 161 | 38 | 30 | 30 | 30 | F |
| 8 | 19 | 30 | 5 | 213 | 63 | 40 | 50 | 55 | E |
| 6 | 19 | 30 | 5 | 249 | 95 | 55 | 65 | 75 | C |
| 4 | 19 | 40 | 6 | 318 | 152 | 70 | 85 | 95 | BC |
| 3 | 19 | 40 | 6 | 346 | 189 | 85 | 100 | 115 | C |
| 2 | 19 | 40 | 6 | 378 | 234 | 95 | 115 | 130 | B |
| 1 | 19 | 50 | 7 | 435 | 299 | 110 | 130 | 145 | B |
| 1/0 | 19 | 50 | 7 | 474 | 372 | 125 | 150 | 170 | B |
| 2/0 | 19 | 50 | 7 | 518 | 462 | 145 | 175 | 195 | B |
| 3/0 | 19 | 50 | 7 | 568 | 575 | 165 | 200 | 225 | B |
| 4/0 | 19 | 50 | 7 | 624 | 718 | 195 | 230 | 260 | B |
| 250 | 37 | 60 | 8 | 678 | 851 | 215 | 255 | 290 | B |
| 300 | 37 | 60 | 8 | 730 | 1012 | 240 | 285 | 320 | B |
| 350 | 37 | 60 | 8 | 777 | 1174 | 260 | 320 | 350 | B |
| 400 | 37 | 60 | 8 | 821 | 1334 | 280 | 335 | 380 | B |
| 500 | 37 | 60 | 8 | 902 | 1655 | 320 | 380 | 430 | B |
| 600 | 61 | 70 | 9 | 998 | 1987 | 350 | 420 | 475 | C |
| 750 | 61 | 70 | 9 | 1126 | 2464 | 400 | 475 | 535 | C |
| 1000 | 61 | 70 | 9 | 1275 | 3257 | 455 | 545 | 615 | C |

**Sizes 14 - 10 AWG not available with patented SIM Technology® No Lube® jacket. Sizes 8 and larger available with patented SIM Technology®. + Allowable ampacities shown are for general uses as specified by the National Electrical Code, 2011 Edition, section 310.15 unless the equipment is marked for use at higher temperatures the conductor ampacity shall be limited to the following. 60 °C - When terminated to equipment for circuits rated 100 amperes or less or marked for size 14 through 1 AWG conductors. MTW wet locations or when exposed to oil or coolant. 75 °C - When terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than size 1 AWG. THWN-2 when exposed to



SIMpull THHN

oil or coolant. MTW dry locations. 90 °C - THHN dry locations. THWN-2; wet or dry locations. For ampacity derating purposes. For derating purposes use Article 315 of the National Electrical Code.

SOUTHWIRE ALUMINUM SER CABLE

[RELATED SECTION 26 27 26]

Location: underneath various trailers

Features:

Conductor size: 1/0-1/0-1/0-2 and 4/0-4/0-4/0-2/0

Stranding 10 and 19

Sunlight resistant

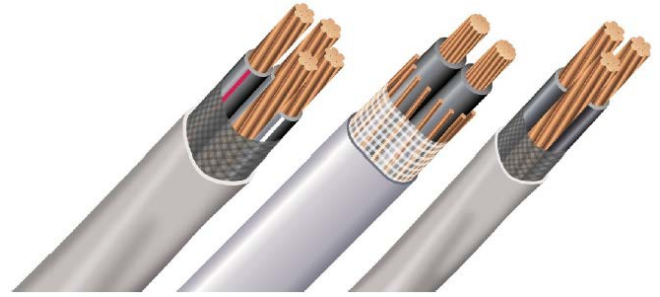
Electrical:

Current: 60C 100, 75C 120, 90C 135 and 60C 150, 75C 180, 90C 205

Approval Certificates:

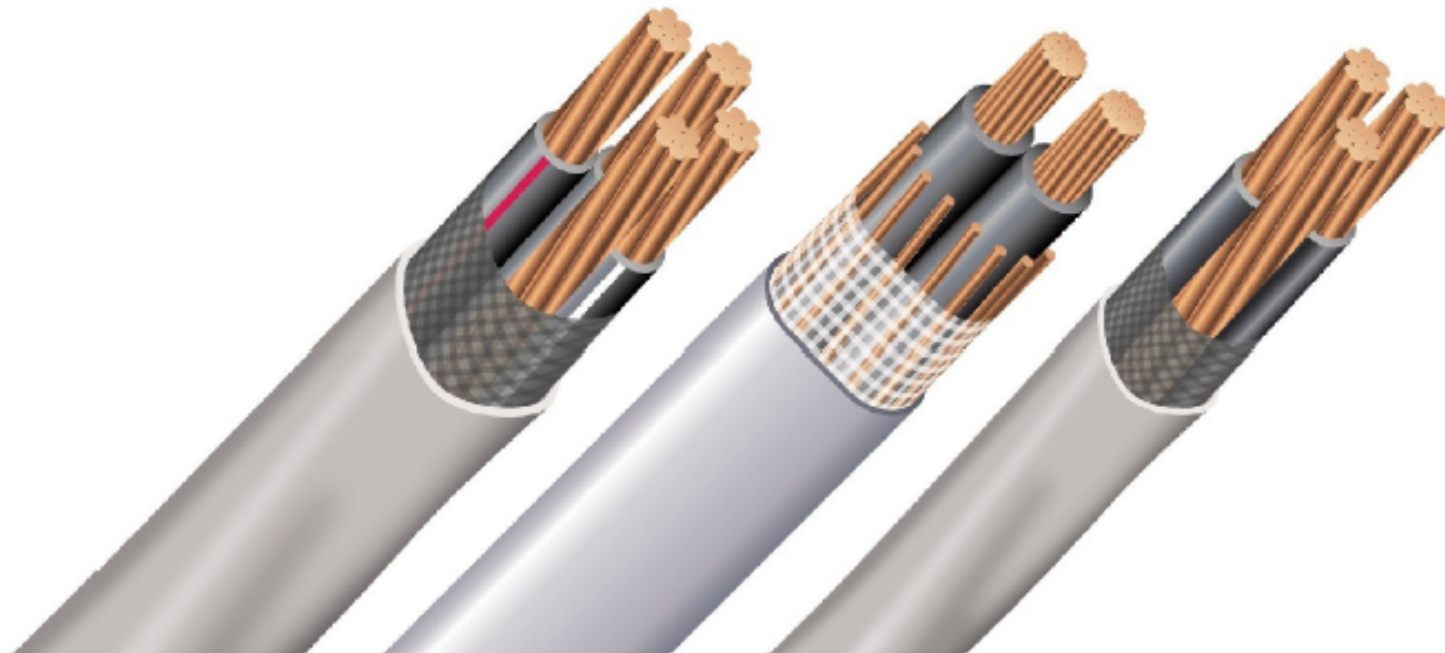
UL Listed

Available: Lowes



Copper SE Cable

Service Entrance Cable, Type SE, Style SER and SE Stype U.
 Service Entrance Cable, 600 Volt.
 Individual Conductors Rated XHHW-2 or THHN/THWN.
 Jacket and Individual Conductors Sunlight Resistant.



APPLICATIONS

Southwire Type SE, service entrance cable is primarily used to convey power from the service drop to the meter base and from the meter base to the distribution panelboard; however, the cable may be used in all applications where Type SE cable is permitted. SER may be used in wet or dry locations at temperatures not to exceed 90°C. Voltage rating is 600 volts.

SPECIFICATIONS

Southwire Type SE cable meets or exceeds UL Standard 44 for XHHW-2 conductors or UL 83 for THHN/THWN conductors, UL Standard 854, Federal Specification A-A-59544, and requirements of the 2008 National Electrical Code.

CONSTRUCTION

Southwire Type cable is constructed with sunlight resistant Type XHHW-2 conductors or Type THHN/THWN conductors. Copper conductors are annealed (soft) copper. Cable assembly plus reinforcement tape are jacketed with sunlight resistant gray polyvinyl chloride (PVC). Available as 1 conductor with a concentric ground, 2 conductor with a round or concentric ground, or 3 conductor with a bare ground. SE cable is jacketed with gray sunlight resistant polyvinyl chloride (PVC).



Southwire
 One Southwire Drive
 Carrollton, Ga. 30119 USA

greenSpec[™]
 RoHS Compliant



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 of Southwire Company.

CU SER and SEU

| Conductor | Copper | | | | | | | | |
|--|----------------------------|----------------------------|---------------------|-----------------------|------|------|----------|---|------------------|
| | Stranding | | Nominal O.D. (mils) | Allowable Ampacities+ | | | | Approx. Net Weight Per 1000' (lbs.) | Standard Package |
| | Phase Conductors & Neutral | Equipment Ground Conductor | | 60°C | 75°C | 90°C | Dwelling | | |
| SER TWO CONDUCTOR WITH BARE GROUND (FORMERLY REFERRED TO AS "THREE CONDUCTOR") | | | | | | | | | |
| 8-8-8 | 7 | -- | 588 | 40 | 50 | 55 | -- | 231 | B |
| 6-6-6 | 7 | -- | 669 | 55 | 65 | 75 | -- | 338 | B |
| 4-4-4 | 7 | -- | 771 | 70 | 85 | 95 | 100 | 499 | B |
| 3-3-3 | 7 | -- | 829 | 85 | 100 | 110 | 110 | 612 | B |
| 2-2-2 | 7 | -- | 898 | 95 | 115 | 130 | 125 | 752 | B |
| 1-1-1 | 19 | -- | 1021 | 110 | 130 | 150 | 150 | 948 | C |
| 1/0-1/0-1/0 | 19 | -- | 1114 | 125 | 150 | 170 | 175 | 1169 | C |
| 2/0-2/0-2/0 | 19 | -- | 1209 | 145 | 175 | 195 | 200 | 1445 | C |
| 3/0-3/0-3/0 | 19 | -- | 1317 | 165 | 200 | 225 | 225 | 1792 | C |
| 4/0-4/0-4/0 | 19 | -- | 1438 | 195 | 230 | 260 | 250 | 2227 | C |
| SER THREE CONDUCTOR WITH BARE GROUND (FORMERLY REFERRED TO AS "FOUR CONDUCTOR") | | | | | | | | | |
| 8-8-8-8 | 7 | 7 | 645 | 40 | 50 | 55 | -- | 286 | B |
| 6-6-6-6 | 7 | 7 | 738 | 55 | 65 | 75 | -- | 424 | B |
| 4-4-4-6 | 7 | 7 | 852 | 70 | 85 | 95 | 100 | 586 | B |
| 3-3-3-5 | 7 | 7 | 917 | 85 | 100 | 110 | 110 | 721 | B |
| 2-2-2-4 | 7 | 7 | 992 | 95 | 115 | 130 | 125 | 889 | B |
| 1-1-1-3 | 19 | 7 | 1132 | 110 | 130 | 150 | 150 | 1119 | C |
| 1/0-1/0-1/0-2 | 19 | 7 | 1235 | 125 | 150 | 170 | 175 | 1384 | C |
| 2/0-2/0-2/0-1 | 19 | 19 | 1342 | 145 | 175 | 195 | 200 | 1715 | C |
| 3/0-3/0-3/0-1/0 | 19 | 19 | 1462 | 165 | 200 | 225 | 225 | 2131 | C |
| 4/0-4/0-4/0-2/0 | 19 | 19 | 1598 | 195 | 230 | 260 | 250 | 2652 | C |
| Table values reflect Type XHHW-2 conductors. | | | | | | | | STANDARD PACKAGE CODE: -B 1000' Reel -C 500' Reel | |
| +Allowable Ampacities: Allowable ampacities shown are for general use as specified by the National Electrical Code, 2008 Edition, section 310.15. 60°C - When terminated to equipment for circuits rated 100 amperes or less or marked for 14 through 1 AWG conductors. 75 °C - When terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than 1 AWG. 90°C - Wet or dry locations. For ampacity derating purposes. Dwelling - For dwelling units, conductors shall be permitted at listed ampacities as 120/240-volt, 3-wire, single-phase services and feeders. | | | | | | | | | |

CU SER and SEU

| Conductor | Copper | | | | | | | | |
|--|------------------|-------------|---------------------|-----------------------|------|------|---|-------------------------------------|------------------|
| | Stranding | | Nominal O.D. (mils) | Allowable Ampacities+ | | | | Approx. Net Weight Per 1000' (lbs.) | Standard Package |
| | Phase Conductors | Bare Ground | | 60°C | 75°C | 90°C | Dwelling | | |
| SEU ONE CONDUCTOR WITH A BARE CONCENTRIC GROUND (FORMERLY REFERRED TO AS "TWO CONDUCTOR") | | | | | | | | | |
| 8-8 | 7 | 8 | 400 | 40 | 50 | 55 | -- | 144 | BH |
| 6-6 | 7 | 12 | 435 | 55 | 65 | 75 | -- | 208 | BH |
| 4-4 | 7 | 12 | 506 | 70 | 85 | 95 | -- | 315 | BI |
| 2-2 | 7 | 15 | 580 | 95 | 115 | 130 | -- | 485 | BJ |
| SEU TWO CONDUCTOR WITH A BARE CONCENTRIC GROUND (FORMERLY REFERRED TO AS THREE CONDUCTOR) | | | | | | | | | |
| 10-10-10 | 1 | 12 | 428 X 283 | 30 | 30 | 30 | -- | 127 | BH |
| 8-8-8 | 7 | 8 | 587 X 380 | 40 | 50 | 55 | -- | 211 | BH |
| 6-6-6 | 7 | 12 | 659 X 416 | 55 | 65 | 75 | -- | 308 | BJ |
| 4-4-4 | 7 | 12 | 815 X 506 | 70 | 85 | 95 | 100 | 471 | BJ |
| 3-3-3 | 7 | 12 | 883 X 548 | 85 | 100 | 110 | 110 | 583 | BJ |
| 2-2-2 | 7 | 15 | 944 X 578 | 95 | 115 | 130 | 125 | 718 | BL |
| 1-1-1 | 19 | 14 | 1093 X 664 | 110 | 130 | 150 | 150 | 904 | CL |
| 1/0-1/0-1/0 | 19 | 18 | 1179 X 707 | 125 | 150 | 170 | 175 | 1123 | CM |
| 2/0-2/0-2/0 | 19 | 18 | 1283 X 767 | 145 | 175 | 195 | 200 | 1379 | CM |
| 3/0-3/0-3/0 | 19 | 14 | 1429 X 862 | 165 | 200 | 225 | 225 | 1712 | CM |
| 4/0-4/0-4/0 | 19 | 18 | 1541 X 918 | 195 | 230 | 260 | 250 | 2146 | CM |
| SEU TWO CONDUCTOR WITH A BARE CONCENTRIC GROND (FORMERLY REFERRED TO AS "THREE CONDUCTOR") (REDUCED NEUTRAL) | | | | | | | | | |
| 6-6-8 | 7 | 8 | 659 X 416 | 55 | 65 | 75 | -- | 281 | BI |
| 4-4-6 | 7 | 12 | 790 X 481 | 70 | 85 | 95 | 100 | 420 | BJ |
| 3-3-5 | 7 | 15 | 843 X 508 | 85 | 100 | 110 | 110 | 515 | BJ |
| 2-2-4 | 7 | 12 | 929 X 563 | 95 | 115 | 130 | 125 | 639 | BL |
| Table values reflect Type XHHW-2 conductors +Allowable Ampacities: Allowable ampacities shown are for general use as specified by the National Electrical Code, 2008 Edition, section 310.15. 60°C - When terminated to equipment for circuits rated 100 amperes or less or marked for 14 through 1 AWG conductors. 75 °C - When terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than 1 AWG. 90°C - Wet or dry locations. For ampacity derating purposes Dwelling - For dwelling units, conductors shall be permitted at listed ampacities as 120/240-volt, 3-wire, single-phase services and feeders. | | | | | | | STANDARD PACKAGE CODE: -B 1000' Reel -C 500' Reel -H 250' Reel -I 200' Coil -J 150' Coil -L 100' Coil -M 50' Coil | | |

RECOMMENDED SAMPLE SPECIFICATIONS:

Cable shall be UL-listed Type SE, suitable for operation at 600 volts. Conductors shall be annealed copper, weather resistant PVC jacketed, as manufactured by Southwire Company or approved equal.

SOUTHWIRE THERMOSTAT WIRE

[RELATED SECTION 26 27 26]

Model Number: 64162143

Location: throughout The Solar Homestead

Dimensions:

Diameter 132 mils

Features:

Jacket thickness: 14 mils

Conductor size: 18 AWG

Number of conductors: 2

Conductor colors: red, white

Sunlight resistant

Can be used in temperatures up to 140°F

Electrical:

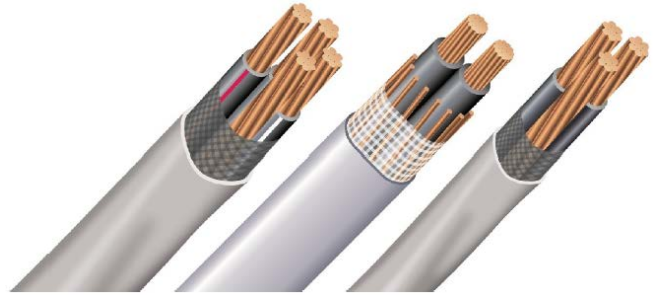
Voltage: 150 V

Current: 60C

Approval Certificates:

UL Listed

Available: Lowes



THERMOSTAT WIRE

Sunlight-Resistant 60°C.150 volts
18 and 20 Gauge Copper Conductors.



APPLICATIONS

Southwire's Thermostat Wire is a class 2 power-limited circuit cable for use in heating and air conditioning controls (bell and alarm systems).

SPECIFICATIONS

- CL2- Power Limited per NEC Article 725. MP- Multi Purpose Cable per Articles 725, 760, and 800.
- CM-Communication Cable per Article 800
- FPL - Power Limited Fire Protective Signaling Cable per Article 760
- Sunlight Resistant, PVC Insulation, and Solid Bare Copper per UL Standard 13
- RoHS Compliant
- OSHA Acceptable

CONSTRUCTION

Southwire Thermostat Wire is manufactured using solid copper conductors with 6 mils of polyvinyl chloride insulation. The two conductor cable is flat - multiconductor cables are round.

Thermoset Wire

| 18 Gauge Thermostat Wire | | | | | |
|---------------------------------|--|-----------------------------|---------------------------------------|-------------------------------------|-------------------------|
| Size (AWG)/Number of Conductors | Conductor Colors | Jacket Thickness Nom.(mils) | Approx. Overall Cable Diameter (mils) | Approx. Net Weight Per 1000' (lbs.) | Standard Lengths Put-Up |
| 18/2 | Red, White | 14 | 132 | 16.0 | 4 X 500' sps/ctn |
| 18/3 | Red, White, Green | 14 | 140 | 21.7 | 4 X 500' sps/ctn |
| 18/4 | Red, White, Green, Blue | 14 | 154 | 27.5 | 4 X 500' sps/ctn |
| 18/5 | Red, White, Green, Blue, Yellow | 15 | 170 | 33.7 | 4 X 250' sps/ctn |
| 18/6 | Red, White, Green, Blue, Yellow, Brown | 15 | 186 | 39.6 | 4 X 250' sps/ctn |
| 18/7 | Red, White, Green, Blue, Yellow, Brown, Orange | 15 | 186 | 45.1 | 4 X 250' sps/ctn |
| 18/8 | Red, White, Green, Blue, Yellow, Brown, Orange, Black | 15 | 202 | 51.0 | 4 X 250' sps/ctn |
| 18/9 | Red, White, Green, Blue, Yellow, Brown, Orange, Black, Pink | 15 | 218 | 56.9 | 4 X 250' sps/ctn |
| 18/10 | Red, White, Green, Blue, Yellow, Brown, Orange, Black, Pink, Gray | 15 | 246 | 64.8 | 4 X 250' sps/ctn |
| 18/12 | Red, White, Green, Blue, Yellow, Brown, Orange, Black, Pink, Gray, Tan, Purple | 15 | 245 | 74.1 | 4 X 250' sps/ctn |

All Thermostat wire is constructed with solid conductors, polypropylene insulation (8 mils), parallel conductors, PVC jacket, 25 pF/ft capacitance between conductors @ 1 KHz (Nom.), and 6.32 Ohms/1000 foot DC resistance per conductor @ 20°C (nom.)

| 20 Gauge Thermostat Wire | | | | | |
|---------------------------------|---|-----------------------------|---------------------------------------|-------------------------------------|-------------------------|
| Size (AWG)/Number of Conductors | Conductor Colors | Jacket Thickness Nom.(mils) | Approx. Overall Cable Diameter (mils) | Approx. Net Weight Per 1000' (lbs.) | Standard Lengths Put-Up |
| 20/2 | Red, White | 14 | 114 | 11.2 | 4 X 500' sps/ctn |
| 20/3 | Red, White, Green | 14 | 121 | 14.7 | 4 X 500' sps/ctn |
| 20/4 | Red, White, Green, Blue | 14 | 132 | 18.3 | 4 X 500' sps/ctn |
| 20/5 | Red, White, Green, Blue, Yellow | 15 | 147 | 22.2 | 4 X 500' sps/ctn |
| 20/6 | Red, White, Green, Blue, Yellow, Brown | 15 | 160 | 25.9 | 4 X 500' sps/ctn |
| 20/7 | Red, White, Green, Blue, Yellow, Brown, Orange | 15 | 160 | 29.2 | 4 X 500' sps/ctn |
| 20/8 | Red, White, Green, Blue, Yellow, Brown, Orange, Black | 15 | 173 | 32.8 | 4 X 250' sps/ctn |
| 20/9 | Red, White, Green, Blue, Yellow, | 15 | 185 | 36.5 | 4 X 250' sps/ctn |

Thermosat Wire

| | | | | | |
|-------|--|----|-----|------|------------------|
| | Brown, Orange, Black, Pink | | | | |
| 20/10 | Red, White, Green, Blue, Yellow, Brown, Orange, Black, Pink, Gray | 15 | 202 | 40.2 | 4 X 250' sps/ctn |
| 20/12 | Red, White, Green, Blue, Yellow, Brown, Orange, Black, Pink, Gray, Tan, Purple | 15 | 209 | 47.0 | 4 X 250' sps/ctn |

All Thermostat wire is constructed with solid conductors, polypropylene insulation (8 mils), parallel conductors, PVC jacket, 22 pF/ft capacitance between conductors @ 1 KHz (Nom.), and 10.73 Ohms/1000 foot DC resistance per conductor @ 20°C (nom.)

TE CONNECTIVITY USE-2

[RELATED SECTION 26 27 26]

Model Number: 1986164

1986165

Location: Great Porch Canopy

Features:

Wire gauge: 10 and 12 AWG

Electrical:

Voltage: 600 V

Approval Certificates:

UL Listed

Available: TE Connectivity



Installation Manual

Solar Cable


| USE-2 Solar AWG Cable | | | |
|-----------------------|-------|-------------|----------|
| Wire Size | Color | Part Number | Quantity |
| 14 AWG | Black | 1986166-2 | 500 |
| | Black | 1986166-3 | 2500 |
| 12 AWG | Black | 1986165-2 | 500 |
| | Black | 1986165-3 | 1600 |
| 10 AWG | Black | 1986164-2 | 500 |
| | Black | 1986164-3 | 1000 |



This UV resistant cable can be used in the following photovoltaic applications:

- Between solar panels
- Between solar roof tiles
- Between panels and the AC/DC inverters

Approval:

- UL 854 approved 
- Approved for outdoor use

Material:

- Cable conductor is pre-tinned, stranded copper wire.
- Outside wire jacket provides a robust layer of protection and is UV resistant

Voltage:

600V

Temperature Range:

-40 °C - +90 °C

LITTLEFUZE MIDGET 5AG

[RELATED SECTION 26 28 13]

Model Number: 4397K312

Location: Electrical Closet

Dimensions:

Length: 13/32"

Width: 1-1/2"

Features:

AC interrupt-current: 10,000 A for 250 Vac fuses, 100,000 A for 600 Vac fuses

DC interrupt-current: 10,000 A

Approval Certificates:

UL Listed

Available: McMaster-Carr



Need help finding a product?
E-mail or call (562) 463-4277.

Don't see the fuse you need? Just tell us what you're looking for and we'll get it for you.

Midget Fuses



While these fuses provide additional equipment protection, they're not designed for power distribution branch circuits. UL listed and CSA certified. Designed for use with [Non-UL Class Midget Fuse Blocks](#).

Fast-Acting Fuses—AC interrupt-current rating is 10,000 amps for 250 VAC fuses (except 12 amp is 750 amps) and 100,000 amps for 600 VAC fuses. DC interrupt-current rating is 10,000 amps for DC-rated fuses.

| Amps | VAC/VDC | Dia. | O'all Lg. | Each | |
|-----------------------------------|---------|--------|--------------|-----------------|-----------------|
| | | | | 1-9 | 10-Up |
| Fast-Acting Fuses | | | | | |
| Fuse Types: DCM, ATM, KLKD | | | | | |
| 15 | 600/600 | 13/32" | 1 1/2" | 4397K312 | \$12.92 \$11.63 |

[Catalog Page](#) | [Bookmark](#)

Midget Fast-Acting Fuse
600 VAC, 15 Amps, Fuse
Types:Dcm, ATM, Klkd

Each

In stock

EATON CUTLER HAMMER CH COMBINATION ARC FAULT CIRCUIT BREAKERS

[RELATED SECTION 26 28 16.13]

Model Number: CH120CAFCS

Location: throughout The Solar Homestead

Features:

- CH 3/4" fireguard

- 1 pole

- AIR: 10 k

Electrical:

- Voltage: 120/240 Vac

- Current: 20 A

Approval Certificates:

- UL Listed

- CSA Listed

- ANSI Certified

Available: Lowes

Price:



AFCI PRODUCT SELECTION GUIDE



CH TYPE AFCI PRODUCTS - 3/4"

| Catalog Number | Style Number | Description |
|----------------|--------------|---|
| CH115AF | 96-5654-1 | CH 3/4" FIREGUARD AFCI 1 Pole, 15 Amp, 120/240Vac, 10kAIC |
| CH115AFCS | CH115AFCS | CH 3/4" FIREGUARD AFCI 1 Pole, 15 Amp, 120/240Vac, 10kAIC, Clam Shell |
| CH115AFGF | 96-3880-7 | CH 3/4" FIREGUARD AFCI 1 Pole, 15 Amp With 5ma GFCI |
| CH115CAF | 96-6244-1 | CH 3/4" FIREGUARD COMBINATION TYPE AFCI 1 Pole, 15 Amp, 120/240Vac, 10kAIC |
| CH115CAFCS | 66C1255G155 | CH 3/4" FIREGUARD COMBINATION TYPE AFCI 1 Pole, 15 Amp, 120/240Vac, 10kAIC CLAM SHELL |
| CH115CAFPN | 96-6244-11 | CH 3/4" FIREGUARD COMBINATION TYPE AFCI 1 Pole, 15 Amp, 120/240Vac, 10kAIC, Plug-On-Neutral |
| CH120AF | 96-5654-2 | CH 3/4" FIREGUARD AFCI 1 Pole, 20 Amp, 120/240Vac, 10kAIC |
| CH120AFCS | CH120AFCS | CH 3/4" FIREGUARD AFCI 1 Pole, 20 Amp, 120/240Vac, 10kAIC, Clam Shell |
| CH120AFGF | 96-3880-8 | CH 3/4" FIREGUARD AFCI With 5ma GFCI 1 Pole 20 Amp |
| CH120CAF | 96-6244-2 | CH 3/4" FIREGUARD COMBINATION TYPE AFCI 1 Pole, 20 Amp, 120/240Vac, 10kAIC |
| CH120CAFCS | 66C1255G156 | CH 3/4" FIREGUARD COMBINATION TYPE AFCI 1 Pole, 20 Amp, 120/240Vac, 10kAIC, CLAM SHELL |
| CH120CAFPN | 96-6244-12 | CH 3/4" FIREGUARD COMBINATION TYPE AFCI 1 Pole, 20 Amp, 120/240Vac, 10kAIC, Plug-On-Neutral |
| CH215AF | 96-5352 | CH 3/4" FIREGUARD AFCI 2 Pole 15 Amp, 120/240Vac, 10kAIC |
| CH215AFGF | 96-5351 | CH 3/4" FIREGUARD AFCI With 5 ma GFCI 2 Pole 15 Amp 240V |
| CH215AFIT | 96-5352-3 | CH 3/4" FIREGUARD AFCI 2 Pole 15 Amp For Shared Neutral Circuit |
| CH220AF | 96-5352-2 | CH 3/4" FIREGUARD AFCI 2 Pole 20 Amp 240V |
| CH220AFGF | 96-5351-2 | CH 3/4" FIREGUARD AFCI With 5 ma GFCI 2 Pole 20 Amp 240V |
| CH220AFIT | 96-5352-4 | CH 3/4" FIREGUARD AFCI 2 Pole 20 Amp For Shared Neutral Circuit |

EATON CUTLER HAMMER CH CIRCUIT BREAKERS

[RELATED SECTION 26 28 16.13]

Model Number: CH115

CH120

CH215

CH220

CH230

Location: throughout The Solar Homestead

Features:

CH 3/4"

1 and 2pole

AIR: 10 k

Electrical:

Voltage: 120/240 Vac

Current: varies between 15, 20, and 30 A

Approval Certificates:

UL Listed

CSA Listed

ANSI Certified

Available: Lowes

Price:



Data Tables

TABLE 1-2. TYPE CH BREAKERS, 3/4-INCH (19.1 MM) PER POLE 120, 120/240 OR 240 VAC, 10 kAIC

| Ampere Rating | Wire Size Range Cu/Al 60°C or 75°C | 1-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space | | 2-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces | | 3-Pole 240 Vac Common Trip Requires Three 3/4-Inch (19.1 mm) Spaces | |
|---------------|------------------------------------|---|--------------|--|--------------|--|--------------|
| | | 10 per Shelf Carton | | 5 per Shelf Carton | | 5 per Shelf Carton | |
| | | 10 kAIC Catalog Number | UPC Code | 10 kAIC Catalog Number | UPC Code | 10 kAIC Catalog Number | UPC Code |
| 10 | (1) #14 – 8 ① | CH110 | 782113906744 | CH210 | 782113906751 | CH310 | 782113906768 |
| 15 | (2) #14 – 10 ①② | CH115 ②③ | 782113101620 | CH215 ④ | 782113101729 | CH315 ④ | 782113101996 |
| 20 | (1) #14 – 6 ② | CH120 ②③ | 782113101644 | CH220 ④ | 782113101767 | CH320 ④ | 782113102023 |
| 25 | | CH125 ④ | 782113121420 | CH225 ④ | 782113121451 | CH325 ④ | 782113121482 |
| 30 | | CH130 ④ | 782113101668 | CH230 ④ | 782113101804 | CH330 ④ | 782113102054 |
| 35 | #14 – 2 ① #14 – 6 ② | CH135 ④ | 782113316987 | CH235 ④ | 782113312248 | CH335 ④ | 782113316994 |
| 40 | #10 – 1/0 ④ | CH140 ④ | 782113101675 | CH240 ④ | 782113101835 | CH340 ④ | 782113102078 |
| 45 | #14 – 2 ③ | CH145 ④ | 782113510811 | CH245 ④ | 782113317014 | CH345 ④ | 782113356266 |
| 50 | #3/0 ④ | CH150 ④ | 782113101682 | CH250 ④ | 782113101859 | CH350 ④ | 782113102092 |
| 60 | | CH160 ④ | 782113871141 | CH260 ④ | 782113101873 | CH360 ④ | 782113102115 |
| 70 | | CH170 | 782113871158 | CH270 | 782113101897 | CH370 | 782113102139 |
| 80 | | — | — | CH280 | 782113312293 | CH3080 | 782113146768 |
| 90 | | — | — | CH290 | 782113101910 | CH3090 | 782113102399 |
| 100 | | — | — | CH2100 | 782113102375 | CH3100 | 782113102405 |
| 110 | | — | — | CH2110 | 782113317038 | — | — |
| 125 | | — | — | CH2125 | 782113298788 | — | — |
| 150 | | — | — | CH2150 ⑤ | 782113298795 | — | — |

① For 1- and 2-pole breakers.
 ② Solid and stranded wire can be used together.
 ③ For 3-pole breakers.
 ④ 1-pole 80 – 70 amperes, 2-pole 80 – 125 amperes, 3-pole 40 – 100 amperes.
 ⑤ 1-pole 40 – 50 amperes, 2-pole 40 – 70 amperes.
 ⑥ 2-pole 150 amperes.
 ⑦ Switching duty rated.
 ⑧ HACR rated.
 ⑨ CH2150 requires 4-pole spaces and is not suitable for use on 3-phase panels. Not CSA certified.

TABLE 1-3. TYPE CH BREAKERS, 3/4-INCH (19.1 MM) PER POLE 120, 120/240 OR 240 VAC, 10 kAIC — CLAMSHELLS

| Ampere Rating | Wire Size Range Cu/Al 60°C or 75°C | 1-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space | | 2-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces | |
|---------------|------------------------------------|---|--------------|--|--------------|
| | | 6 per Shelf Carton | | 3 per Shelf Carton | |
| | | 10 kAIC Catalog Number | UPC Code | 10 kAIC Catalog Number | UPC Code |
| 15 | (1) #14 – 8 ⑥ | CH115CS ⑥⑦ | 782114752500 | CH215CS ⑧ | 782114752531 |
| 20 | (2) #14 – 10 ⑥⑧ | CH120CS ⑥⑦ | 782114752517 | CH220CS ⑧ | 782114752548 |
| 30 | (1) #14 – 6 ⑥ | CH130CS ⑥ | 782114752524 | CH230CS ⑧ | 782114752555 |
| 40 | #10 – 1/0 ⑥ | CH140CS | 782116630585 | CH240CS ⑧ | 782114752562 |
| 50 | #14 – 2 ⑥ | CH150CS | 782116630592 | CH250CS ⑧ | 782114752579 |
| 60 | #3/0 | — | — | CH260CS ⑧ | 782114752593 |
| 70 | | — | — | CH270CS | 782116630608 |
| 80 | | — | — | CH280CS | 782116630615 |
| 90 | | — | — | CH290CS | 782116630622 |
| 100 | | — | — | CH2100CS | 782116630776 |
| 110 | | — | — | CH2110CS | 782116630783 |
| 125 | | — | — | CH2125CS | 782116630790 |

⑥ For 1- and 2-pole breakers.
 ⑦ Solid and stranded wire can be used together.
 ⑧ For 3-pole breakers.
 ⑨ 1-pole 80 – 70 amperes, 2-pole 80 – 125 amperes, 3-pole 40 – 100 amperes.
 ⑩ 1-pole 40 – 50 amperes, 2-pole 40 – 70 amperes.
 ⑪ Switching duty rated.
 ⑫ HACR rated.

SQUARE D QO ARC-D-TECT ARC FAULT CIRCUIT BREAKERS

[RELATED SECTION 26 28 16.13]

Model Number: QO115AFI

QO120AFI

Location: throughout The Solar Homestead

Features:

1 pole

AIR: 10 k

Electrical:

Voltage: 120 V

Current: 15 and 20 A

Approval Certificates:

UL Listed

CSA Listed

ANSI Certified

Available: Consolidated Electrical Distribution



Interrupting Rating

The interrupting rating of a circuit breaker is the highest current at rated voltage that the circuit breaker is intended to interrupt under standard test conditions. A circuit breaker must be chosen so that the interrupting rating is equal to or greater than the maximum available short-circuit current at the point where the circuit breaker is applied in the system.

Table 1: Interrupting Ratings

| Circuit Breaker Type | Number of Poles | Ampere Rating | UL Listed Interrupting Rating ¹ | | | |
|-----------------------|-----------------|---------------|--|--------------------|--------------------|---------------------|
| | | | 120 Vac | 120/240 Vac | 240 Vac | 48 Vdc ² |
| QO | 1 | 10-70 A | 10 kA | 10 kA | — | 5 kA |
| | 2 | 10-70 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | | 80-100 A | 10 kA | 10 kA | 10 kA | — |
| | | 110-200 A | 10 kA | 10 kA | — | — |
| | 3 | 15-60 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | | 70-100 A | 10 kA | 10 kA | 10 kA | — |
| QOB | 1 | 10-70 A | 10 kA | 10 kA | — | 5 kA |
| | 2 | 10-70 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | | 80-100 A | 10 kA | 10 kA | 10 kA | — |
| | | 110-125 A | 10 kA | 10 kA | — | — |
| | 3 | 15-60 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | | 70-100 A | 10 kA | 10 kA | 10 kA | — |
| QO-H, QOB-H | 2 | 15-100 A | 10 kA ³ | 10 kA ³ | 10 kA ³ | — |
| QO-VH | 1 | 15-30 A | 22 kA | 22 kA | — | — |
| | 2 | 15-200 A | 22 kA | 22 kA | — | — |
| | 3 | 15-100 A | 22 kA | 22 kA | 22 kA | — |
| QOB-VH | 1 | 15-30 A | 22 kA | 22 kA | — | — |
| | 2 | 15-125 A | 22 kA | 22 kA | — | — |
| | 3 | 15-150 A | 22 kA | 22 kA | 22 kA | — |
| QOH | 1 | 40-125 A | 42 kA | 42 kA | — | — |
| QH, QHB | 1 | 15-30 A | 65 kA | 65 kA | — | — |
| | 2 | 15-30 A | 65 kA | 65 kA | — | — |
| | 3 | 15-30 A | 65 kA | 65 kA | 65 kA | — |
| QO-GFI, QOB-GFI | 1 | 15-30 A | 10 kA | — | — | — |
| | 2 | 15-60 A | 10 kA | 10 kA | — | — |
| QO-VHGF, QOB-GFI | 1 | 15-30 A | 22 kA | — | — | — |
| QO-AFI, QOB-AFI | 1 | 15-30 A | 10 kA | — | — | — |
| QO-CAFI, QOB-CAFI | 1 | 15-30 A | 10 kA | — | — | — |
| QO-VHCAFI, QOB-VHCAFI | 1 | 15-30 A | 22 kA | — | — | — |
| QO-EPD, QOB-EPD | 1 | 15-30 A | 10 kA | — | — | — |
| | 2 | 15-60 A | 10 kA | 10 kA | — | — |
| QO-PL | 1 | 15-30 A | 10 kA | 10 kA | 10 kA | — |
| | 2 | 15-30 A | 10 kA | 10 kA | 10 kA | — |
| | 3 | 15-30 A | 10 kA | 10 kA | 10 kA | — |

¹ 10 kA and 5 kA are 1Ø-3Ø.

² DC ratings do not apply to circuit breakers rated 10 A.

³ UL Listed 5,000 AIR on 3Ø grounded B-Phase Delta system.

DC Voltage Rating

QO and QOB circuit breakers are available with a UL Listed 48 Vdc rating. See Table 1. Refer to Square D Data Bulletin 0601DB0401 for additional information on dc-rated circuit breakers.

SQUARE D QO ARC-D-TECT CIRCUIT BREAKERS

[RELATED SECTION 26 28 16.13]

Model Number: QO115CP

QO120CP

QO220CP

QO230CP

QO240CP

QO260CP

Location: throughout The Solar Homestead

Features:

1 and 2pole

All double-poles with a common trip

AIR: 10 k

Electrical:

Voltage: 120 V, 120/240 V

Current: varies between 15, 20, 30, 40, 60 A

Approval Certificates:

UL Listed

CSA Listed

ANSI Certified

Available: Consolidated Electrical Distribution



Interrupting Rating

The interrupting rating of a circuit breaker is the highest current at rated voltage that the circuit breaker is intended to interrupt under standard test conditions. A circuit breaker must be chosen so that the interrupting rating is equal to or greater than the maximum available short-circuit current at the point where the circuit breaker is applied in the system.

Table 1: Interrupting Ratings

| Circuit Breaker Type | Number of Poles | Ampere Rating | UL Listed Interrupting Rating ¹ | | | |
|-----------------------|-----------------|---------------|--|--------------------|--------------------|---------------------|
| | | | 120 Vac | 120/240 Vac | 240 Vac | 48 Vdc ² |
| QO | 1 | 10-70 A | 10 kA | 10 kA | — | 5 kA |
| | 2 | 10-70 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | | 80-100 A | 10 kA | 10 kA | 10 kA | — |
| | | 110-200 A | 10 kA | 10 kA | — | — |
| | | 15-60 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | 3 | 70-100 A | 10 kA | 10 kA | 10 kA | — |
| QOB | | 1 | 10-70 A | 10 kA | 10 kA | — |
| | 2 | 10-70 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | | 80-100 A | 10 kA | 10 kA | 10 kA | — |
| | | 110-125 A | 10 kA | 10 kA | — | — |
| | | 15-60 A | 10 kA | 10 kA | 10 kA | 5 kA |
| | 3 | 70-100 A | 10 kA | 10 kA | 10 kA | — |
| QO-H, QOB-H | | 2 | 15-100 A | 10 kA ³ | 10 kA ³ | 10 kA ³ |
| QO-VH | 1 | 15-30 A | 22 kA | 22 kA | — | — |
| | 2 | 15-200 A | 22 kA | 22 kA | — | — |
| | 3 | 15-100 A | 22 kA | 22 kA | 22 kA | — |
| QOB-VH | 1 | 15-30 A | 22 kA | 22 kA | — | — |
| | 2 | 15-125 A | 22 kA | 22 kA | — | — |
| | 3 | 15-150 A | 22 kA | 22 kA | 22 kA | — |
| QOH | 1 | 40-125 A | 42 kA | 42 kA | — | — |
| QH, QHB | 1 | 15-30 A | 65 kA | 65 kA | — | — |
| | 2 | 15-30 A | 65 kA | 65 kA | — | — |
| | 3 | 15-30 A | 65 kA | 65 kA | 65 kA | — |
| QO-GFI, QOB-GFI | 1 | 15-30 A | 10 kA | — | — | — |
| | 2 | 15-60 A | 10 kA | 10 kA | — | — |
| QO-VHGF, QOB-GFI | 1 | 15-30 A | 22 kA | — | — | — |
| QO-AFI, QOB-AFI | 1 | 15-30 A | 10 kA | — | — | — |
| QO-CAFI, QOB-CAFI | 1 | 15-30 A | 10 kA | — | — | — |
| QO-VHCAFI, QOB-VHCAFI | 1 | 15-30 A | 22 kA | — | — | — |
| QO-EPD, QOB-EPD | 1 | 15-30 A | 10 kA | — | — | — |
| | 2 | 15-60 A | 10 kA | 10 kA | — | — |
| QO-PL | 1 | 15-30 A | 10 kA | 10 kA | 10 kA | — |
| | 2 | 15-30 A | 10 kA | 10 kA | 10 kA | — |
| | 3 | 15-30 A | 10 kA | 10 kA | 10 kA | — |

¹ 10 kA and 5 kA are 1Ø-3Ø.

² DC ratings do not apply to circuit breakers rated 10 A.

³ UL Listed 5,000 AIR on 3Ø grounded B-Phase Delta system.

DC Voltage Rating

QO and QOB circuit breakers are available with a UL Listed 48 Vdc rating. See Table 1. Refer to Square D Data Bulletin 0601DB0401 for additional information on dc-rated circuit breakers.

****LUTRON DUPLEX RECEPTACLE**

[RELATED SECTION 26 30 00]

Model Number: CAR-15H [-WH, -GR]

Location: Interior White Walls [-WH], Interior Gray Walls [-GR]

Finish: White, Gray

Features:

Grounding

Actuator Material: Thermoplastic

Body Material: Thermoplastic

Termination: Rear Push-in and Side

Electrical:

3 Wire

Current: 15 A

Voltage: 125 V

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$3.99

LUTRON DUPLEX GFCI RECEPTACLE**[RELATED SECTION 26 30 00]**

Model Number: CAR-15-GFTRH [-WH, -GR]

Location: Interior White Walls [-WH], Interior Gray Walls [-GR] in areas that may come in contact with water

Finish: White, Gray

Features:

1 Gang

Flush Mounted

Tamper-Resistant

Ground Fault Circuit Interrupter

Built-in circuit breakers automatically trip if the threat of shock exists

Electrical:

Current: 15 A

Voltage: 125 V

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$30.67





6-gang* CW-6-**CC**²
SC-6-**CC**⁴
W: 12.00in (305mm); H: 4.69in (119mm);
D: .30in (7.6mm)

Cable jacks



- F-style, 75-Ohm coaxial cable

Single cable jack* CA-CJH-**CC**³
SC-CJ-**CC**⁴

Telephone jacks



- 6-conductor telephone jack, RJ11

Single telephone jack* CA-PJH-**CC**³
SC-PJ-**CC**⁴

CC²: Gloss and Stainless Steel color codes, see pg. 161

CC³: Gloss color codes, see pg. 161

CC⁴: Satin color codes, see pg. 161

Receptacles



Tamper resistant receptacles

| | |
|------------|--|
| 15A, 125V* | CARS-15-TR- CC ³ SCRS-15-TR- CC ⁴ |
| 20A, 125V* | SCRS-20-TR- CC ⁴ |

Receptacles

| | |
|------------|---|
| 15A, 125V* | CAR-15H- CC ³ SCR-15- CC ⁴ |
| 20A, 125V* | SCR-20- CC ⁴ |

GFCI Receptacles



- Press test button to confirm LED indicator status
- Press reset button to reset GFCI after circuit interruption

Tamper resistant GFCI receptacles

| | | |
|------------|------|--|
| 15A, 125V* | GFCI | CAR-15-GFTR- CC ³ SCR-15-GFTR- CC ⁴ |
| 20A, 125V* | GFCI | SCR-20-GFTR- CC ⁴ |

*Stainless Steel finish only available as separate wallplate. Match with separate Black (BL) or Midnight (MN) controls and accessories.

COOPER INDUSTRIES GFCI RECEPTACLE

[RELATED SECTION 26 30 00]

Model Number: TWRGF15 [GY]

Location: exterior locations of The Solar Homestead

Finish: Gray

Features:

- Tamper resistant

- Weather resistant

- Ground Fault Circuit Interrupter

- Built-in circuit breakers automatically trip if the threat of shock exists

Electrical:

- Voltage: 125 V

- Current: 15 A

Approval Certificates:

- UL Listed

- CSA Listed

Available: Lowes

Price: \$16.57





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Cooper Wiring Devices 15-Amp Silver Granite Decorator Tamper-Resistant GFCI Electrical Outlet

Item #: 162341 | Model #:9566TRSG-K

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\$16.57

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| | | | |
|--------------------------|--------------------------|---------------------|------------------|
| Function Type | GFCI | Contractor Pack | No |
| NEMA Configuration | 515R | UL Safety Listing | Yes |
| Material | Plastic | CSA Safety Listing | Yes |
| Wiring | Clamp type back and side | ETL Safety Listing | No |
| | | Color/Finish Family | Gray/Silver |
| | | Grade | Commercial |
| Miswired Indicator Light | Yes | Style | Decorator |
| Package Quantity | 1.0 | Configuration | Straight blade |
| RF Compatible | No | Amps (Amps) | 15.0 |
| Watertight | No | Receptacle Voltage | 125 |
| Wall Plate Included | No | Wiring Type | 3-wire grounding |
| Tamper Resistant | Yes | | |

Modular Receptacles

| | |
|-----------------|--------------|
| Project Name: | Prepared By: |
| Project Number: | Date: |
| Catalog Number: | Type: |



Ground Fault Circuit Interrupter Receptacles

2-Pole, 3-Wire Grounding
15A 125V/AC
20A 125V/AC



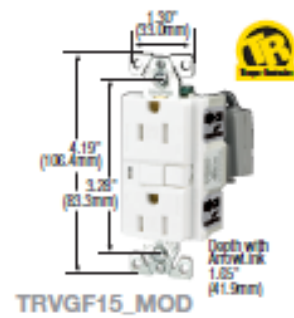
Specification Grade GFCIs

FEATURES

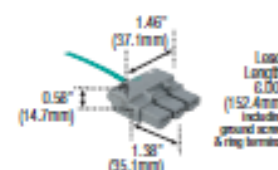
- ArrowLink modular plug and connector incorporate a first make/last break grounding design.
- Wire leads (where applicable) are crimped and resistance welded to plug and connector terminals.
- Audible "click" when mating plug and connector indicates proper assembly.
- Pre-wired plugs provide 100% inspected and consistent torque settings.
- Exclusive screw terminal guards insulate conductive surfaces.
- Tamper Resistant models comply with 2008 NEC® Article 406.11 for all dwelling units.
- ShockSentry™ lock-out function prevents miswired line-load connections and GFCI circuitry damage.

| Back Wire & Side Wire | 15A, 125V NEMA 5-15R | | 20A, 125V NEMA 5-20R | |
|--|---|-----|---|-----|
| Description | Catalog No. Color Suffix | | Catalog No. Color Suffix | |
| Duplex GFCI | ■ VGF15 MOD A, B, BK, GY, LA, RD, V, W | • • | ■ VGF20 MOD A, B, BK, GY, LA, RD, V, W | • • |
| Duplex GFCI NAFTA Compliant | ■ VGF15F MOD B, BK, GY, LA, RD, V, W | • • | ■ VGF20F MOD B, BK, GY, LA, RD, V, W | • • |
| Tamper Resistant Duplex GFCI | ■ TRVGF15 MOD A, B, BK, GY, LA, RD, V, W | • • | ■ TRVGF20 MOD A, B, BK, GY, LA, RD, V, W | • • |
| Tamper Resistant Duplex GFCI NAFTA Compliant | ■ TRVGF15F MOD B, BK, GY, LA, RD, V, W | • • | ■ TRVGF20F MOD B, BK, GY, LA, RD, V, W | • • |
| Weather Resistant Duplex GFCI | ■ WRVGF15 MOD B, GY, V, W | • • | ■ WRVGF20 MOD B, GY, V, W | • • |
| Tamper & Weather Resistant Duplex GFCI | ■ TWRVGF15 MOD B, GY, LA, V, W | • • | ■ TWRVGF20 MOD B, GY, LA, V, W | • • |

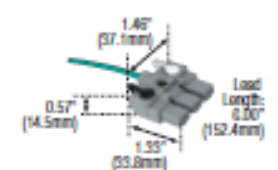
Includes standard size unbreakable wallplate unless otherwise noted
Consult factory customer service representative for additional packaging options



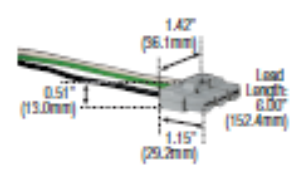
TRVGF15_MOD



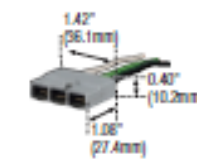
Receptacle SPD Push-In Connector



Receptacle SPD Screw Terminal Connector



Leaded Receptacle Connector



Receptacle Plug

ArrowLink Receptacle Connectors

| Type | Description | Catalog No. |
|---------------|---|----------------|
| ArrowLink SPD | Push-In Building Wire Connector | ■ MCR300FTP1 |
| | Push-In Building Wire Connector, No Ground Conductor | ■ MCR300FTP1NG |
| ArrowLink SPD | Screw Terminal Building Wire Connector | ■ MCR300FTST |
| | Screw Terminal Building Wire Connector, No Ground Conductor | ■ MCR300FTSTNG |
| ArrowLink | 125V Solid Wire Building Wire Connector | ■ MCR125SOL |
| | 125V Stranded Wire Building Wire Connector | ■ MCR125STR |
| | 250V Solid Wire Building Wire Connector | ■ MCR250SOL |
| | 250V Stranded Wire Building Wire Connector | ■ MCR250STR |

Patent Pending

Icon Key

- Build-To-Spec Customizable Devices
- NAFTA Compliant, see Arrow Hart Buyer's Guide pg O-30 for more information

TESTING & CODE COMPLIANCE

- Base Device: cULus Listed to UL 498 and UL 943, file no. E60120; meets all UL 943 (GFCI) and UL 498 (Receptacles) and applicable CSA requirements
- ArrowLink: Plug & connector cULus Listed to UL 2459 file no. E325188
- Combined: cULus Listed wiring assembly, UL file no. E326691

MATERIAL CHARACTERISTICS

- Nylon with PVC terminal guards, except single: adhesive terminal barrier
- Environmental, Base Device: Flammability meets UL 94 requirements; V2 rated; temperature rating: -20°C to 90°C (-4°F to 194°F), except single: -20°C to 60°C (-4°F to 140°F)
- Environmental, ArrowLink: Flammability meets UL 94 requirements; V2 rated; temperature rating: -20°C to 90°C (-4°F to 194°F) max.

Modular Receptacles Specification & Performance Data

| | |
|-----------------|--------------|
| Project Name: | Prepared By: |
| Project Number: | Date: |
| Catalog Number: | Type: |



Specification Grade Ground Fault Circuit Interrupter Receptacles

2-Pole, 3-Wire Grounding
15A, 125V/AC; 20A, 125V/AC
NEMA 5-15, 5-20

| | Device Type | Specification Grade GFCI 15A & 20A: VGF_MOD and VGF_F_MOD Series ArrowLink: MCR125_, MCR250_, MCR300_ Series | Specification Grade Tamper Resistant & Weather Resistant Duplex GFCI 15A & 20A: TRVGF_MOD, TRVGF_F_MOD, WRVGF_MOD, TWRVGF_MOD Series ArrowLink: MCR125_, MCR250_, MCR300_ Series |
|--|-----------------------|--|--|
| Wiring Type | Base Device | Back & side wire | Back & side wire |
| | ArrowLink | Integral wire leads, crimped & resistance welded | Integral wire leads, crimped & resistance welded |
| | ArrowLink SPD | Backwire feed through | Backwire feed through |
| Testing & Code Compliance | Base Device | <ul style="list-style-type: none"> cULus Listed to UL 498 and UL 943, file no. E60120 Meets all UL 943 (GFCI), UL 498 (Receptacles) and applicable CSA requirements NOM certified | <ul style="list-style-type: none"> cULus Listed to UL 498 and UL 943, file no. E60120 Meets all UL 943 (GFCI), UL 498 (Receptacles) and applicable CSA requirements NOM certified |
| | ArrowLink | <ul style="list-style-type: none"> Plug & connector cULus Listed to to UL 2459, file no. E325188 | <ul style="list-style-type: none"> Plug & connector cULus Listed to to UL 2459, file no. E325188 |
| | Combined | <ul style="list-style-type: none"> cULus Listed wiring assembly, UL file no. E326691 | <ul style="list-style-type: none"> cULus Listed wiring assembly, UL file no. E326691 |
| Specifications: Environmental | Base Device | Flammability | Meets UL 94 requirements; V2 rated |
| | | Temperature Rating | -35°C to 66°C (-31°F to 150.8°F) |
| | ArrowLink | Flammability | Meets UL 94 requirements; V2 rated |
| | | Temperature Rating | -35°C to 66°C (-31°F to 150.8°F) |
| Specifications: Electrical | Base Device | Dielectric Voltage | Withstands 2000V per UL 498 |
| | | Current Interrupting | Yes, at full-rated current |
| | | Temperature Rise | Temperature Rise: max. 30°C (86°F) after 100 cycles of overload @ 150% of rated current (DC) |
| | | Trip Time | 0.025 seconds (Class A) |
| | | Frequency | 60 Hz; Voltage: 125V; Amperage: 15A/20A 20A Feed Through |
| | | Short Circuit Testing | Meets and exceeds 10 kA |
| | ArrowLink | Maximum Interrupting Capacity | 20 Amps |
| | | Max. Working Voltage | 300V/AC |
| | | Max. Continuous Current | 20A |
| | | Overload | 52.5A/AC for 10 cycles |
| | | Dielectric Voltage | Withstands 1600V per UL 2459 |
| | | Current Interrupting | Limited cycles at full-rated current |
| Specifications: Mechanical | Base Device | Temperature Rise | Max. 50°C (122°F) while conducting 35A after 10 cycles of overload @ 52.5A/AC |
| | | Max. Working Voltage | 300V/AC |
| | | Max. Continuous Current | 20A |
| | | Overload | 52.5A/AC for 10 cycles |
| | | Dielectric Voltage | Withstands 1600V per UL 2459 |
| | | Current Interrupting | Limited cycles at full-rated current |
| | ArrowLink | Temperature Rise | Max. 50°C (122°F) while conducting 35A after 10 cycles of overload @ 52.5A/AC |
| | | Max. Working Voltage | 300V/AC |
| | | Max. Continuous Current | 20A |
| | | Overload | 52.5A/AC for 10 cycles |
| | | Dielectric Voltage | Withstands 1600V per UL 2459 |
| | | Current Interrupting | Limited cycles at full-rated current |
| Specifications: Screw Terminal Guards | ArrowLink Models Only | Base Device Terminal Accommodation | #14 - #10 AWG |
| | | ArrowLink Wire Leads | #12 AWG |
| | | ArrowLink SPD Screw Terminals | Accepts #12-#14 stranded and solid wire |
| | | ArrowLink SPD Ground | Integral THHN #12 AWG 6" lead with ring terminal and #10 ground screw |
| | | Voltage Ratings | Permanently marked on device |
| Materials | Base Device | Material: UL recognized insulating material Dielectric Strength: 2,000V min HWI Rating: 4 min. Relative temperature Index, electrical: 80°C (176°F) Flammability: V0 (UL 94) | Material: UL recognized insulating material Dielectric Strength: 2,000V min HWI Rating: 4 min. Relative temperature Index, electrical: 80°C (176°F) Flammability: V0 (UL 94) |
| | | Top Housing | Thermoplastic, nylon |
| | | Bottom Housing | PVC |
| | | Strap | 0.047" thick steel, zinc plated |
| | | Line Contacts | 0.030" thick brass |
| | | Terminal & Ground Screws | #8-32 steel, brass plated; neutral screw nickel plated, ground screw green |
| | ArrowLink | Terminal Clamps | 0.070" thick steel |
| | | Housing | Polycarbonate |
| | | Contacts | Copper alloy |
| | ArrowLink SPD | Wire Leads | Solid or stranded THHN #12 AWG |
| | | Housing | Polycarbonate |
| | | Contacts | Copper alloy |

Specifications subject to change without notice.

TAYMAC RECEPTACLE COVER

[RELATED SECTION 26 30 00]

Model Number: ML450G

Location: Exterior

Dimensions:

Width: 4"

Height: 6"

Depth: 1-1/4"

Finish: Gray

Features:

Polycarbonate and neoprene rubber are durable in sunlight

Quick-Fit keyhole mounting system

Paintable surface

Approval Certificates:

UL Listed

ETL Listed

Available: The Home Depot

Price: \$7.97





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| Description | Specifications | Reviews | More Info | Shipping |
|-------------|----------------|---------|-----------|----------|
|-------------|----------------|---------|-----------|----------|

| | | | | |
|---|--|--|--|--|
| <ul style="list-style-type: none"> • Electrical Product Type : Power/Lighting Wall Plate • Height (in.) : 6.106 in • Item Package Type : No Package • Item Weight : .4 lb • Manufacturer Warranty : NO • Product Depth (in.) : 1.248 • Product Height (in.) : 6.106 • Product Width (in.) : 4.021 • Returnable : 90-Day • Screws Included : Yes • Shape : Rectangle • UL Listed : 1-UL Listed • Wallplate Material : Plastic • Width (in.) : 4.021 in | | | | |
|---|--|--|--|--|

SANYO BIFACIAL PHOTOVOLTAIC MODULE

[RELATED SECTION 26 31 00]

Model Number: HIP 195DA3

Location: Great Porch Canopy

Dimensions:

Length: 53.2" [1351 mm]

Width: 35.35" [898 mm]

Height: 2.36" [60 mm]

Weight: 50.7 lbs [23 kg]

Features:

Cell efficiency: 19.3%

Module efficiency: 16.1%

Static load: 50 psf [2400 Pa]

Electrical:

Wattage: 195 W

Voltage: 600 V

Current: 15 A

Approval Certificates:

UL Listed

cUL

CEC

Available: Graybar Electric Company

Bifacial Photovoltaic Module

HIT Double195

Photovoltaic Module

Power per Square Foot up to 19.1 Watts



High Efficiency

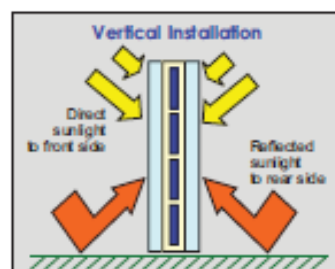
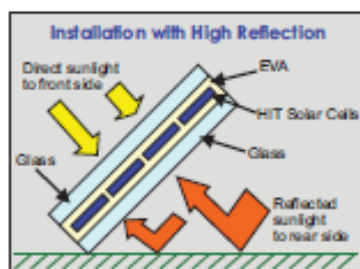
HIT® Double bifacial solar panels are the World leaders in sunlight conversion efficiency, helping customers to enjoy the maximum power per square foot from available space.

Power Guarantee

SANYO guarantees customers will receive 100% of the panel's rated power (or more) at the time of purchase, enabling owners to generate more kWh per rated watt.

Bifacial Effect

The back face of HIT Double solar panels generates electricity from ambient light reflected off surrounding surfaces, and combines with power from the front face of the panel. Dependant upon system design and site albedo, this results in up to 30% higher power generation (more kWh) per square foot.



Application Possibilities

- Architectural, Awnings, Balconies, Bus Shelters, BIPV
- Deck & Porch Coverings, Canopies, Carports, Facades
- Fences, Siding, Trellises, Tracking Systems

Proprietary Technology

HIT bifacial solar cells are hybrids of single crystalline silicon surrounded by ultra-thin amorphous silicon layers, available solely from SANYO.

High Temperature Performance

As temperatures rise, HIT Double solar panels produce more electricity than conventional solar panels at the same temperature, for good performance in high temperature sites.

Quality Products

SANYO silicon wafers are made in California USA, and assembled in Mexico at SANYO's certified factory. ISO 9001 (quality), 14001 (environment), 18001 (safety).

Valuable Features

HIT Double panels operate silently and have no moving parts. A double glass structure allows some sunlight to penetrate portions of the panel, creating brilliant light and shadows for aesthetic and architectural applications. HIT Double panels are perfect for areas with performance-based incentives and tradable energy credits.

Electrical Specifications

| Model: HIP-195DA3 | STC ¹ | Specifications Including Backside Irradiation Contribution in ISC as a Percent of STC | | | | | |
|--|------------------|---|--------|--------|--------|--------|--------|
| | | 5% | 10% | 15% | 20% | 25% | 30% |
| Rated Power (P _{max}) ¹ | 195 W | 204 W | 213 W | 222 W | 231 W | 240 W | 249 W |
| Maximum Power Voltage (V _{mp}) | 55.8 V | 55.8 V | 55.8 V | 55.9 V | 56.0 V | 56.0 V | 56.1 V |
| Maximum Power Current (I _{mp}) | 3.5 A | 3.66 A | 3.82A | 3.97 A | 4.13A | 4.29 A | 4.45A |
| Open Circuit Voltage (V _{oc}) | 68.7 V | 68.9 V | 69.0 V | 69.1 V | 69.2 V | 69.2 V | 69.5 V |
| Short Circuit Current (I _{sc}) | 3.73 A | 3.92 A | 4.10A | 4.29 A | 4.48A | 4.66 A | 4.85A |
| Max. System Voltage (V _{sys}) | 600 V | — | — | — | — | — | — |
| Series Fuse Rating | 15 A | — | — | — | — | — | — |
| Temperature Coefficient (P _{max}) | -0.34% / °C | — | — | — | — | — | — |
| Temperature Coefficient (V _{oc}) | -0.192 V / °C | — | — | — | — | — | — |
| Temperature Coefficient (I _{sc}) | 1.70 mA / °C | — | — | — | — | — | — |
| Warranted Tolerance | +10/-0% | — | — | — | — | — | — |
| Cell Efficiency | 19.3% | — | — | — | — | — | — |
| Module Efficiency ² | 16.1% | 16.8% | 17.6% | 18.3% | 19.0% | 19.8% | 20.5% |
| Power per Square Foot | 14.9 W | 15.6 W | 16.3 W | 17.0 W | 17.7 W | 18.4 W | 19.1 W |

Mechanical Specifications

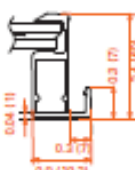
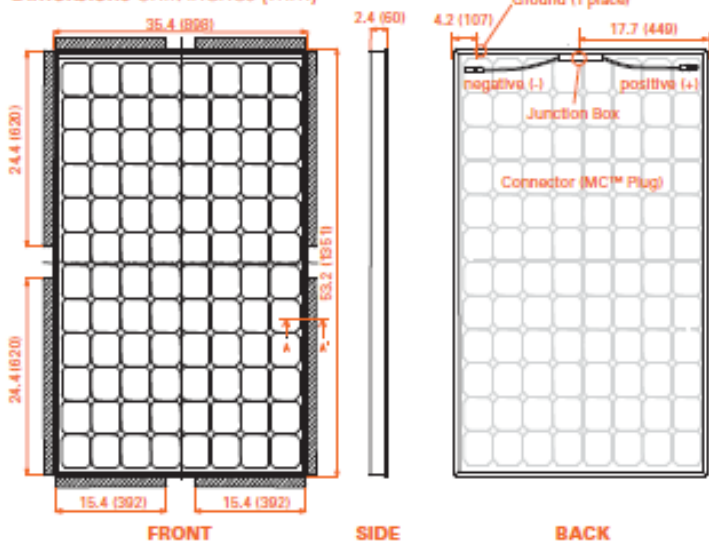
| | |
|------------------------------------|--|
| Internal Bypass Diodes | 4 Bypass Diodes |
| Module Area | 13.06 FT ² (1.21 m ²) |
| Module Weight | 50.7 Lbs. (23 kg) |
| Module Dimensions LxWxH | 53.2 x 35.35 x 2.36 in. (1351 x 898 x 60 mm) |
| Cable Lengths | 39.4 in. each (1000 mm) |
| Cable Size / Connector Type | No. 12 AWG / MC3™ Connectors |
| Static Load | 50 PSF (2400 Pa) |
| Pallet Dimensions LxWxH | 54.3 x 36 x 70.1 in. (1379 x 912 x 1781 mm) |
| Full Pallet Quantity & Weight | 20 pos. / 1014 Lbs. (460 kg) |
| Quantity per 20'x40'x53' Container | 200 pos., 420 pos., 540 pos. |

Safety Ratings & Limited Warranty

| | |
|--------------------------------|---|
| Fire Safety Classification | Class A |
| Hail Safety Impact Velocity | 1" hailstone (25 mm) at 25 mph (23 m/s) |
| NOCT (°C) | 113°F (45°C) |
| Safety & Rating Certifications | UL 1703, cUL, CEC |
| Limited Warranties | 2 Years Workmanship / 20 Years Power Output |

¹Standard Test Conditions: Cell Temperature 25°C, Air Mass 1.5, 1000 W/m²
²Equivalent module efficiency, including power from the back face.
 Note: Specifications and information above may change without notice.

Dimensions Unit: inches (mm)



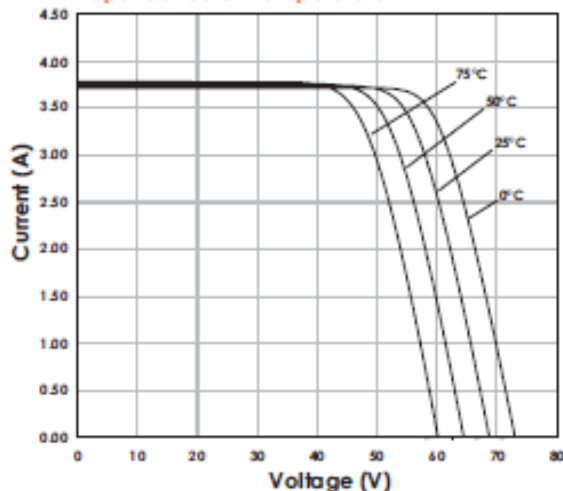
Note: A module must be installed on a support structure rail using four symmetrical mounting points within Range A

▨ = Range A

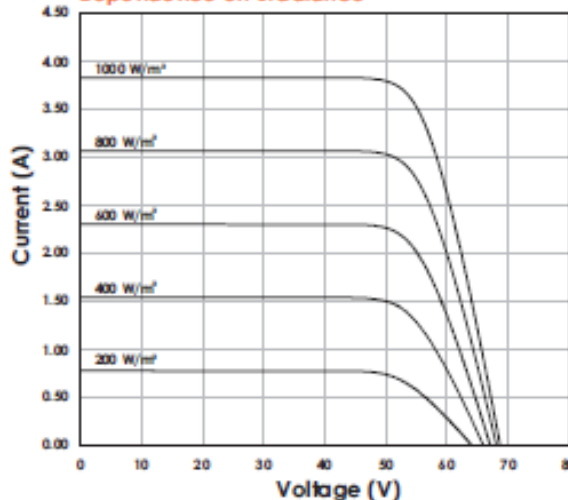
To Maximize Power

1. Elevate panels above a surface as much as possible.
2. Place panels over light-colored surfaces.
3. Do not allow support rails to shade the panel's back face.

Dependence on Temperature



Dependence on Irradiance



IMPORTANT: The rated power of HIT[®] Double bifacial solar panels is measured under Standard Test Conditions (STC). STC does not account for power produced from the back face of panels. Therefore, HIT Double panels will produce more power than their STC rating, up to 30% more, depending upon the system design and site albedo. Account for the additional power when sizing, selecting system components and wiring.

CAUTION! Read the operating instructions carefully before use of these products

SANYO

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A Division of SANYO North America Corporation

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www.sanyo.com/solar
solar@sec.sanyo.com

SUPER BRIGHT LEDS LED STRIP

[RELATED SECTION 26 51 13]

Model Number: NFLS-WW3000

Location: Living Core, Hallways, Bedroom Cove

Dimensions:

Length: 197"

Features:

Adhesive backing

Number of LEDs: 300

Type of LED: 3528SMD

Light color: warm white

Dominant wavelength: 2900K \pm 100K

Single LED luminous flux or intensity: 3.7lm

Lumen per foot: 71 lm/ft

Total lumen: 1110lm

IP rating: Non-Weatherproof

Electrical:

Wattage: 3.6 W

Voltage: 9-14.8 V DC [approximately 12 V]

Current draw @12 V per unit: 1300 mA

Approval Certificates:

FCC

CE

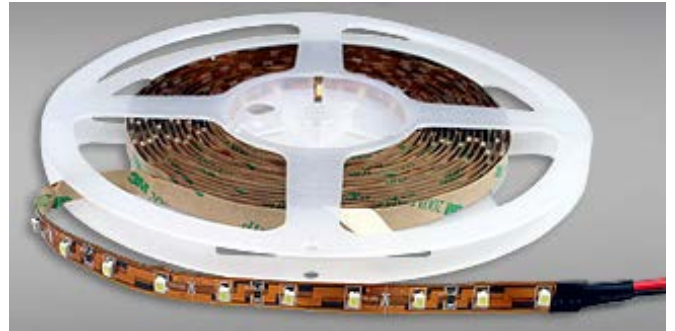
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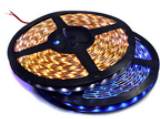
UL Safety Approval

Available: Super Bright LEDs

Price: \$99.95



NFLS-x300: 300 High Power LED Flexible Light Strip Reel



- 5 Meter (197 Inch) Non-Weatherproof Flexible Light Strip with 300 High Power LEDs
- 12 VDC Operation
- Can be cut into 3-LED segments
- LEDs on highly flexible strip with adhesive backing
- Sold on reel - See solderless connectors below
- Price for each.

Select Options

Part#:

Color:

\$ 99.95

Enter Quantity: 1

[Add to Cart](#)

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NFLS-x300X3: 300 High Power LED Flexible Light Strip Reel



- 5 Meter (197 Inch) Non-Weatherproof Flexible Light Strip with 300 High Power 3-Chip 5050SMD LEDs
- 12 VDC Operation
- Can be cut into 3-LED segments
- LEDs on highly flexible strip with adhesive backing
- Sold on reel - See NFLS10-2CS type solderless connectors below
- Price for each.

Select Options

Part#:

Color:

\$ 149.95

Enter Quantity: 1

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NFLS-x30X3: 30 High Power LED Flexible Light Strip



- 1/2 Meter (19.5 Inch) long Non-weatherproof Flexible Light Strip with 30 High Power 3-Chip 5050SMD LEDs
- 12 VDC Operation
- Can be cut into 3-LED segments
- LEDs on highly flexible strip with adhesive backing
- Sold on reel - See NFLS10-2CS type solderless connectors below
- Price for each.

Select Options

Part#:

Color:

\$ 15.95

Enter Quantity: 1

[Add to Cart](#)

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NFLS-x60: 60 High Power LED Flexible Light Strip



- 1 Meter (39 Inch) long Non-weatherproof Flexible Light Strip with 60 High Power LEDs
- Can be cut into 3-LED segments
- LEDs on highly flexible strip with adhesive backing
- 12 VDC Operation - See solderless connectors below
- Price for each.

Select Options

Part#:

Color:

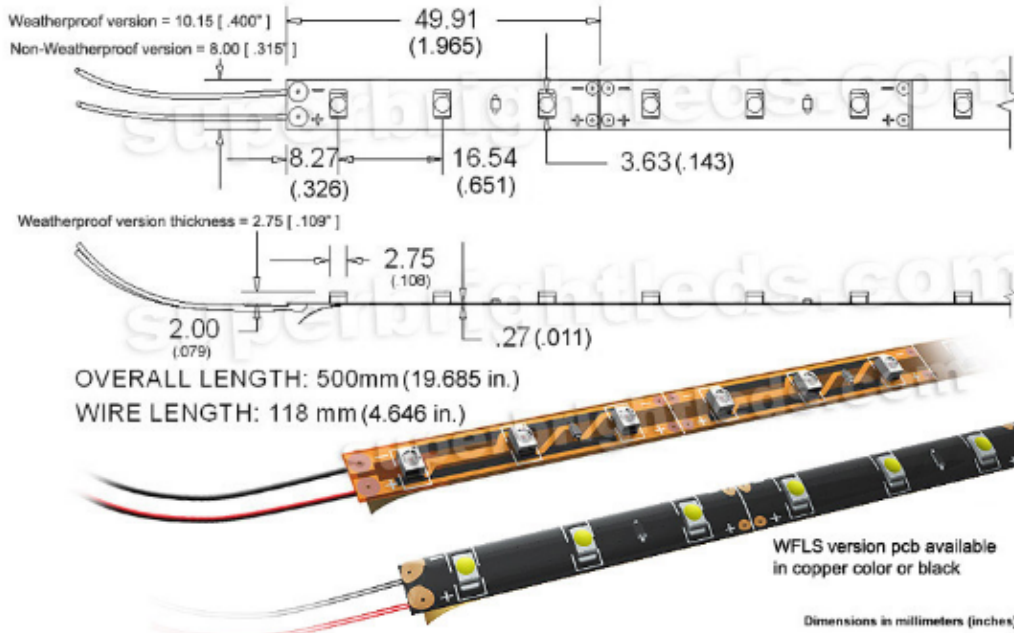
\$ 19.95

Enter Quantity: 1

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NFLS-x30

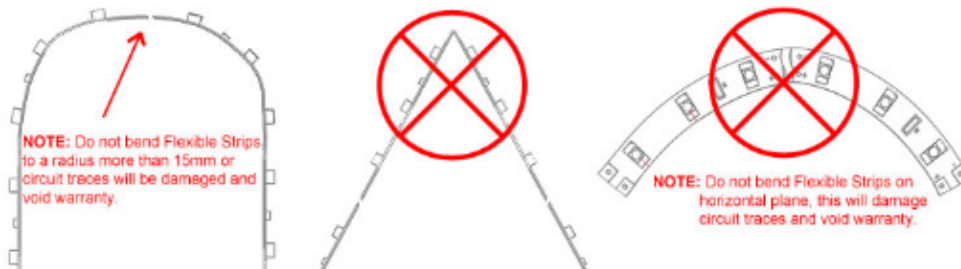


NFLS-2CS

NFLS strip solderless interconnect
 Wire Length: 75 mm / 2.95 in
 22 ga. wire



Maximum Flexibility Precaution



ELEMENTAL LED PUCK LIGHT

[RELATED SECTIONS 26 51 13]

[RELATED SECTIONS 26 56 00]

Model Number: EL-DIM3WCREE

Location: Bay Window, Living Module, Bedroom Light Wall, Flex Space Light Wall, Outdoor Kitchen

Dimensions:

Diameter: 2-3/4"

Depth: 1/2"

Features:

Dimmable

Features cree LEDs

3 LEDs per puck

90° beam angle

Input voltage: 12Vdc

Lead wire length: 3 ft

Available colors: neutral white, warm white

Lumens: 190 [ww], 218 [nw]

Color temperature: 2800-3500 [ww], 5500-6000k [nw]

CRI: 90

IP rating: 63

Fixture surface temperature: 68° - 154°F

Electrical:

Wattage: 3.6 W

Voltage: 12 Vdc

Current: 0.3 A

Efficiency:





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Cree 3W Dimmable LED Puck Light

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GALLERY



SKU: EL-DIM3WCREE

Dimmable
Features Cree LED chips
Draws only 3.6 Watts
15% brighter than standard LED puck

[Product Info Sheet](#)

Suggested Accessories

[12V Inline Dimmer Switch](#)
\$23.99

[DC Splitter Plugs](#)
\$3.49

[DC Plug 1 Meter Extension Cable](#)
\$3.99

Product Options

Color:

Finish:

Qty:

\$49.99

[Add to Cart](#)



3 Piece Cree Dimmable LED Puck Light Kit

EL-DIM3PKKT

These specs are for one puck:

Weight: 4 oz.
 Width: 2.72 in.
 Depth: 0.53 in.
 Lead Wire Length: 3 feet
 Fixture Surface Temp.: 68° - 154° F
 UV/IR Radiation: None
 Lifespan: 50,000+ hours



This 3 Piece Cree Dimmable LED Puck Light Kit emphasizes energy efficiency and quality. LED pucks were designed with the kitchen in mind, but are also great for other difficult-to-light areas in your household – perhaps the corner office nook where you struggle with the printer or the dark garage shelves which cry out for light (can you ever find anything without a flashlight?). Whether you choose the kit in neutral white or warm white, you will benefit from the clarity these puck-shaped lights provide in every instance. Built from brushed aluminum, these stylishly-designed dimmable LED kitchen lights fit seamlessly into today's contemporary homes.

This Cree LED Puck Light 3 Pack features superior and brighter bulbs made by Cree, the most cutting-edge manufacturer of LEDs in the world. Every plug-and-play LED light kit comes with:

- * 3 Cree LED Puck Lights
- * a DC 3-Way Splitter
- * a 12V Inline Dimmer Switch
- * a 24 Watt Plug-In DC Adapter

They also offer a long-term lighting solution. Our LED cabinet lights are estimated to last for more than 50,000 hours. Based on average use, that's a lifetime of 7 to 8 years. How many other appliances or products in your house can you count on for that long? Better still, these lights consume very little energy. Each light is less than 3 inches across and contains three tiny LED bulbs. A single kit includes an adapter, splitter and screws. Each kit consumes just 9 watts, well below the amount required of traditional incandescent light bulbs. Your electricity bill will drop if you are replacing traditional incandescent bulbs.

You can trust that our high-quality Elemental products are manufactured according to the strictest standards. The LED kitchen lights, like the others devices in our collection, hold the prestigious RoHS, or Restriction of Hazardous Substances, certification. This ensures that no environmentally harmful components were used in the manufacturing process. Not sure if LED cabinet lights are the right products for your home or business? Contact us for a customized plan that will bring beauty and efficiency to your space, all at a reasonable price.



| color | bulb type | color temp. | voltage | lumens | IP rating | beam angle | power consumption / puck | CRI | # of LEDs |
|---------------|-----------|-------------|---------|--------|-----------|------------|--------------------------|-----|-----------|
| warm white | Cree | 2800-3500k | 12V DC | 190 | 63 | 90° | 3.6W / 300mA | 90 | 3 |
| neutral white | Cree | 5500-6000k | 12V DC | 218 | 63 | 90° | 3.6W / 300mA | 90 | 3 |

ELEMENTAL 24" LED BAR LIGHT

[RELATED SECTION 26 51 13]

[RELATED SECTIONS 26 56 00]

Model Number: EL-BRTWPBAR

Location: Flex Bath Vanity, within Site Walls

Dimensions:

Width: 3/8"

Height: 3/8"

Features:

Bulb type: high power tri-chip SMD

Dimmable

Waterproof

Not for use in or around chlorinate or salt water

120° beam angle

Input voltage: 12Vdc

IP rating: 68 [submersible]

Fixture surface temperature: 75°F/25°C

LED Spacing: 7/8" [between centers], 5/8" [between edges]

Electrical:

Wattage: 3.6 W

Voltage: 12 V

Current: 0.3 A

Efficiency:

Rate life: 50,000 hrs

Approval Certificates:

ETL

Available: Elemental LED

Price: \$34.49



Waterproof Brighter LED Light Bar

SHARE +

★★★★★
1 review

GALLERY VIDEO



SKU: EL-BRTWPBAR

Waterproof, Durable, Dimmable
Super bright
Not for use in or around chlorinated or salt water

[Product Info Sheet](#)

Suggested Accessories

[Reign 12V LED Dimmer Switches](#)
\$89.99

[Waterproof Solder Connector Pair](#)
\$0.99

Product Options

Color:

Length:

Qty: bar(s)

\$45.99

Add to Cart



Waterproof Brighter LED Light Bar

EL-BRTWPBAR

Width: 0.6 in.
 Height: 0.35 in.
 LED Spacing: 0.8 in. (between centers)
 0.6 in. (between edges)
 Beam Angle: 120°
 IP Rating: 68
 Operating Temp.: 75° F / 25° C
 UV/IR Radiation: None
 Lifespan: 50,000 hours

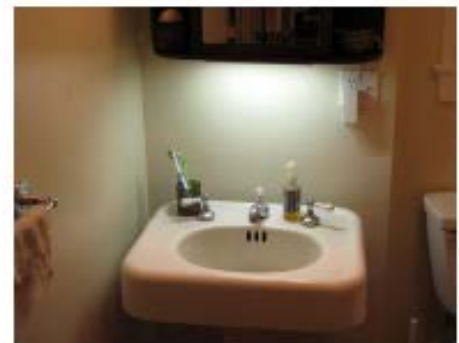
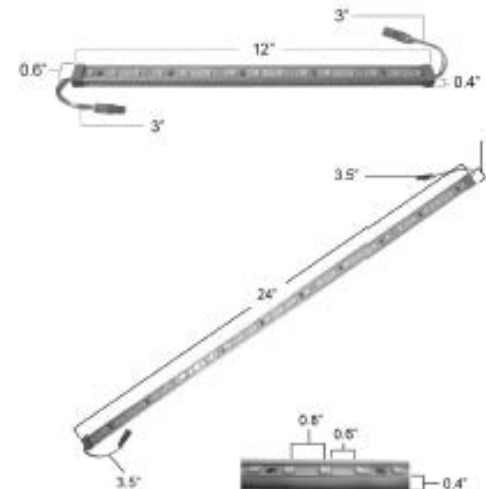


The waterproof version of our Brighter LED Light Bar is here! Elemental's Waterproof Brighter LED Light Bar is not only twice as bright as our standard LED light bar, thanks to its use of high-power tri-chip SMD bulbs, but it's completely waterproof. And with its compact size, this super bright LED light fixture makes a great alternative to the fluorescent tube. The Brighter Waterproof LED Bar can be used for many outdoor purposes:

- * For patio, deck, yard, garden, greenhouse, and pool lighting
- * In the house as kitchen and bathroom lighting, in the laundry room, basement, and garage
- * In businesses such as spas, restaurants, bars, lounges, clubs, and coffee shops
- * Wine caves and cellars (no UV emissions)
- * Vehicular accent lighting for cars, trucks, limousines, and RVs
- * Marine lighting on motor boats, fishing boats, yachts, and cruise ships

This outdoor LED light bar requires a low amount of electricity to power it, only 3.8 to 7.2 Watts per bar, which means both that it is safe, so there is no danger of shock, and that the bar gives off very little heat, making it perfect to light heat-sensitive items such as plants, food, wine, art, etc. Consider swapping out your standard incandescent or fluorescent kitchen lights for a moment. If you are currently using an incandescent source, you will experience a 90% savings by switching to LEDs. That means that the light bar will pay for itself within one year.

Installation of this super bright LED Light Bar is quite simple. Every bar includes mounting clips-- each clip is attached to the surface with two screws--and a pair of waterproof solder connectors for use with a driver. The bar can be powered with one of our waterproof 12V DC power drivers (see below), or with a 12V DC adapter. And, like all Elemental products, this waterproof LED light holds the prestigious ROHS certificate, which ensures that no environmentally harmful components were used in manufacturing.



| length | color | color temp. | voltage | lumens | type of led | power consumption | cri | # of leds |
|--------|---------------|-------------|---------|--------|--------------|-------------------|-----|-----------|
| 12" | warm white | 2700k | 12V DC | 200 | tri-chip SMD | 3.8W / 300mA | 75 | 15 |
| 12" | neutral white | 5000k | 12V DC | 240 | tri-chip SMD | 3.8W / 300mA | 71 | 15 |
| 24" | warm white | 2700k | 12V DC | 400 | tri-chip SMD | 7.2W / 600mA | 75 | 30 |
| 24" | neutral white | 5000k | 12V DC | 480 | tri-chip SMD | 7.2W / 600mA | 71 | 30 |

SYLVANIA 18" T8 LINEAR FLUORESCENT STRIP

[RELATED SECTION 26 51 13]

Model Number: 21656

Location: Core Hallway Skylight, Bedroom Closets, Main House Mechanical Closet, Laundry Closet

Dimensions:

Length: 18"

Color: designer warm white

Features:

Lamp application: fluorescent

Base: medium bi pin

Color temperature: 3,000 Kelvins

Lumens: 900

CRI: 70

Electrical:

Wattage: 15 W

Efficiency:

Rate life: 7500 hrs

Available: Lowes

Price: \$10.79



15 watt 18" T8 Medium Bi-Pin (G13) Base Designer Warm White Preheat Fluorescent Sylvania Light Bulb

(F15T8/DWW/RP)



[Buy now at eLightBulbs!](#)



General Information

Our Part #: SL21656

Sylvania Code: F15T8/DWW/RP

Price: \$10.79 Each

Case Size: 6

Specifications

Light Output: 900 lumens

Energy Used: 15 watts

Average Lifetime: 7500 hours

Bulb Type: T8

Base Type: Medium Bi-Pin (G13)

Bulb Color: Designer Warm White

Color Temperature: 3,000K

CRI: 70

Length: 18 inches

[Buy This Product Online At eLightBulbs!](#)

Search by Sylvania Part #, Watt or Description:



SYLVANIA 48" T8 LINEAR FLUORESCENT STRIP

[RELATED SECTION 26 51 13]

Model Number: 22062

Location: Core Shower

Dimensions:

Length: 48"

Features:

Lamp application: fluorescent

Base: med bi pin

Color temperature: 4,100 Kelvins

Lumens: 2850

CRI: 85

Electrical:

Wattage: 30 W

Efficiency:

Rate life: 40,000 hrs

Available: Lowes

Price: \$5.09





Sylvania 22062 - FO30/841/XP/SS/ECO3 Straight T8 Fluorescent Tube Light Bulb

by [Sylvania](#)

[Be the first to review this item](#) | [Like](#) (0)

Price: **\$5.09**

In stock.

Processing takes an additional 2 to 3 days for orders from this seller.
Ships from and sold by [eLightBulbs](#).

[2 new](#) from \$4.94

Have Questions About Buying Light Bulbs? Check out our [Light Bulb Guide](#) for help choosing the correct bulb for your lighting needs. [Learn more](#)

OCTRON® 800 XP® SUPERSAVER® ECOLOGIC®3

EXtended Performance Fluorescent Lamps



SYLVANIA OCTRON 800 XP SUPERSAVER ECOLOGIC3 lamps operate on standard T8 instant start systems and provide up to 22% energy savings over 32 Watt lamps. At 10¢/kWh and 4000 hours of operation per year, the 22% energy savings translates to a savings of \$11.74 per fixture per year for a 4-lamp fixture with a normal ballast factor, instant start ballast. The initial lumen output and 94% lumen maintenance of the OCTRON 800 XP SUPERSAVER/ECO3 lamps help ensure that light levels are maintained while energy is saved. These lamps pass the Federal TCLP test, classifying them as non-hazardous waste in most states.

For optimal performance and system warranty pair with QUICKTRONIC® electronic ballast systems.

Key Features & Benefits

- Energy savings compared to standard 32W T8 lamp
 - 6% with the 30W XP®/SS
 - 12% with the 28W XP®/SS
 - 22% with the 25W XP®/SS
- 94% lumen maintenance
- 3000K, 3500K, 4100K & 5000K
- 85 CRI
- Dimmable (see application note 4)
- Retrofit lamp for existing T8 instant start systems
 - 40,000 hours rated life @ 12 hours per start
- Increased life on SYLVANIA QUICKTRONIC® PROStart® PSX and PSN programmed rapid start ballasts
 - 42,000 hours rated life @ 12 hours per start
- Available in 4-foot, 8-foot and eXtended Life (XL) types

* SYLVANIA OCTRON ECOLOGIC3 T8 fluorescent lamps pass the Federal Toxic Characteristic Leaching Procedure (TCLP)¹ criteria for classification as non-hazardous waste in most states².

ECOLOGIC3 represents a more comprehensive approach to sustainability encompassing high efficiency, long life and RoHS/TCLP compliance.

1. TCLP test results are based on NEMA LL Series standards and are available on request.
2. Lamp disposal regulations may vary; check your local & state regulations.



Product Offering

| Lamp Type | Wattage | CCT |
|---------------------------|---------|----------------------------|
| F032/25W/800XP/SS/ECO3 | 25 | 3000K, 3500K, 4100K, 5000K |
| F028/800XP/SS/ECO3 | 28 | 3000K, 3500K, 4100K, 5000K |
| F030/800XP/SS/ECO3 | 30 | 3000K, 3500K, 4100K, 5000K |
| F032/25W/800XP/XL/SS/ECO3 | 25 | 3500K, 4100K |
| F028/800XP/XL/SS/ECO3 | 28 | 3500K, 4100K, 5000K |
| F096/800XP/SS/ECO3 | 55 | 3500K, 4100K, 5000K |

Application Information

Applications

- Hospitals
- Industrial
- Office
- Retail
- Schools

Application Notes

1. Recommended to be used on F32T8 instant start ballast with minimum open circuit voltage of 550V RMS at the lamp.
 - a. Electronically ballasted fixture configurations which operate lamps remotely, such as Master/Satellite applications, can cause reduction of lamp open circuit voltage, in the remote fixture, below the minimum required for reliable lamp starting. For more information, please call 1-800-LIGHTBULB and ask for Ballast Technical Assistance or call your fixture manufacturer.
 - b. Not recommended to be used: (1) in remotely ballasted fixtures with lamp open circuit voltages below 550V, (2) with Rapid Start ballasts unless the lamp open circuit voltage is greater than 570V, (3) in air handling fixtures, (4) on low power factor ballasts or (5) inverter operated emergency lighting systems unless any of the above equipment is specifically listed for 30 watt lamps. Any of the above situations could result in lamp starting and stabilization problems, or system compatibility issues.
2. If an operating lamp is exposed to drafts or the ambient temperature falls below 60°F, striation (a rhythmic pulsing pattern of light running down the tube) and/or reduction in lamp brightness may occur. While visually disconcerting, neither behavior is damaging to the lamp and removing the cause (draft or temperature) will return the lamp to normal operation.
3. Fixture must conform to ANSI C78.81–2005 requirements for luminaire design.
4. Contact OSRAM SYLVANIA for approved dimming ballasts.

Ordering Information

| Item Number | Ordering Abbreviation | Nominal Length Watts | Initial Lumens (in) | Mean Lumens | Lumens ¹ per Watt | Average Rated Life | | | | CCT | CRI | |
|---------------------------------------|----------------------------|----------------------|---------------------|-------------|------------------------------|----------------------------|---------------------|--------------------------|----------------------------|--------|-------|----|
| | | | | | | Instant Start 3 hrs/ start | Start 12 hrs/ start | Prog. Start 3 hrs/ start | Rapid Start 12 hrs/ 1start | | | |
| OCTRON® 800 XP® SUPERSAVER® | | | | | | | | | | | | |
| 22232 | F032/25W/830/XP/SS/EC03 | 25 | 48 | 2475 | 2327 | 99 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22233 | F032/25W/835/XP/SS/EC03 | 25 | 48 | 2475 | 2327 | 99 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22234 | F032/25W/841/XP/SS/EC03 | 25 | 48 | 2475 | 2327 | 99 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22235 | F032/25W/850/XP/SS/EC03 | 25 | 48 | 2400 | 2256 | 96 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 80 |
| 22177 | F028/830/XP/SS/EC03 | 28 | 48 | 2725 | 2562 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22178 | F028/835/XP/SS/EC03 | 28 | 48 | 2725 | 2562 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22179 | F028/841/XP/SS/EC03 | 28 | 48 | 2725 | 2562 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22184 | F028/850/XP/SS/EC03 | 28 | 48 | 2600 | 2444 | 93 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 80 |
| 22063 | F030/830/XP/SS/EC03 | 30 | 48 | 2850 | 2679 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22060 | F030/835/XP/SS/EC03 | 30 | 48 | 2850 | 2679 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22062 | F030/841/XP/SS/EC03 | 30 | 48 | 2850 | 2679 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22202 | F030/850/XP/SS/EC03 | 30 | 48 | 2800 | 2632 | 93 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 80 |
| OCTRON® 800 XP® XL SUPERSAVER® | | | | | | | | | | | | |
| 22222 | F032/25W/835/XP/XL/SS/EC03 | 25 | 48 | 2400 | 2304 | 96 | 36,000 | 50,000 | 52,000 | 55,000 | 3500K | 85 |
| 22223 | F032/25W/841/XP/XL/SS/EC03 | 25 | 48 | 2400 | 2304 | 96 | 36,000 | 50,000 | 52,000 | 55,000 | 4100K | 85 |
| 22166 | F028/835/XP/XL/SS/EC03 | 28 | 48 | 2600 | 2496 | 93 | 36,000 | 50,000 | 52,000 | 55,000 | 3500K | 85 |
| 22167 | F028/841/XP/XL/SS/EC03 | 28 | 48 | 2600 | 2496 | 93 | 36,000 | 50,000 | 52,000 | 55,000 | 4100K | 85 |
| 22326 | F028/850/XP/XL/SS/EC03 | 28 | 48 | 2600 | 2496 | 93 | 36,000 | 50,000 | 52,000 | 55,000 | 5000K | 80 |
| OCTRON® F096 XP® SUPERSAVER | | | | | | | | | | | | |
| 22100 | F096/835/XP/SS/EC03 | 55 | 96 | 5700 | 5360 | 104 | 24,000 | 36,000 | | | 3500K | 85 |
| 22101 | F096/841/XP/SS/EC03 | 55 | 96 | 5700 | 5360 | 104 | 24,000 | 36,000 | | | 4100K | 85 |
| 22347 | F096/850/XP/SS/EC03 | 55 | 96 | 5700 | 5360 | 104 | 24,000 | 36,000 | | | 5000K | 81 |

1. Measured at 40% of rated life.

Ordering Guide

| FO | 30 | / | 8 | 35 | XP | / | SS | / | EC03 |
|-----------------------|--|---|--------------------|---|-------------------------|---|------------|---|-----------|
| Fluorescent OCTRON | Actual Wattage = 25, 28, 30, 32 and 55 | | Actual CRI = 85 | Color Temperature 30 = 3000K CCT 35 = 3500K CCT 41 = 4100K CCT 50 = 5000K CCT | EXtended Performance | | SUPERSAVER | | ECOLOGIC3 |

Lamp Dimensions

| Lamp Type | (A) Max. Overall Length (in.) | (B) Base Face to Opposite Pin (in.) | (C) Max. Base Face to Base Face (in.) | (D) Max. Outside Diameter (in.) | Diagram |
|----------------------------------|-------------------------------|-------------------------------------|---------------------------------------|---------------------------------|---------|
| F030 F032/25W F028 F032 | 47.78 | Min. 47.41 Max. 47.50 | 47.22 | 1.1 | |
| F096 | 94.00 | Min. 93.42 Max. 93.65 | 93.30 | 1.1 | |

Related Literature

For maximum energy savings consider pairing with the following electronic ballasts:

Ballast Technology Applications & Specification Guide (Literature code: ECS-Electronic2009)

QUICKTRONIC® High Efficiency NEMA Premium Guide (Literature code: ECS112)

QUICK 60+ System Warranty (Literature code: ECS140)

SYLVANIA, ECOLOGIC, OCTRON, QUICK 60+, SUPERSAVER and XP are registered trademarks of OSRAM SYLVANIA Inc.
SEE THE WORLD IN A NEW LIGHT is a registered trademark of OSRAM SYLVANIA Inc.
QUICKTRONIC is a registered trademark of OSRAM GmbH.

Specification Data

Fixture Description

Type

Project/Job

SYLVANIA lamp

SYLVANIA ballast

Notes

Sample Specification

Lamp(s) shall be OCTRON® 800 XP® SUPERSAVER® ECOLOGIC®3 (25W, 28W, 30W) lamp(s) having medium bi-pin bases. Lamp(s) shall be designed to pass the Federal TCLP test in force at the time of manufacture. Lamps shall have Initial lumens of (2475, 2725, 2850), mean lumens of (2327, 2562, 2679) and a correlated color temperature of (3000, 3500, 4100) Kelvin or Initial lumens of (2400, 2600, 2800) and mean lumens of (2256, 2444, 2632) and a correlated color temperature of 5000K. Lamp(s) shall have an average rated life of (24,000, 40,000) on (instant start, programmed rapid start) ballasts, 94% lumen maintenance at 40% of rated life and a CRI of (85, 80). The OCTRON XP SUPERSAVER ECOLOGIC3 lamp(s) shall be operated on QUICKTRONIC® electronic, high frequency ballasts with complete system warranty from the manufacturer covering lamps and ballast.

United States

OSRAM SYLVANIA

100 Endicott Street
Danvers, MA 01923

Trade

Phone: 1-800-255-5042
Fax: 1-800-255-5043

National Accounts

Phone: 1-800-562-4671
Fax: 1-800-562-4674

OEM/Special Markets

Phone: 1-800-762-7191
Fax: 1-800-762-7192

Display/Optic

Phone: 1-888-677-2627
Fax: 1-800-762-7192

Canada

OSRAM SYLVANIA LTD.

2001 Drew Road
Mississauga, ON L5S 1S4

Trade

Phone: 1-800-263-2852
Fax: 1-800-667-6772

OEM/Special Markets/Display/Optic

Phone: 1-800-265-2852
Fax: 1-800-667-6772

www.sylvania.com

SYLVANIA 48" T5 LINEAR FLUORESCENT STRIP

[RELATED SECTION 26 51 13]

Model Number: 20975

Location: Core Bath

Length: 48"

Features:

Lamp Application: Fluorescent

Base: miniature bi pin

Color temperature: 2,700 Kelvins

Lumens: 2470

CRI: 85

Electrical:

Wattage: 28 W

Efficiency:

Rate life: 20,000 hrs

Available: Lowes



- Light Bulbs
- Ballasts
- Lighting Fixtures
- Tools
- Electrical Supplies
- DataComm Products
- Test - Measurement
- Safety Products
- HVAC
- Fluorescent Tubes**
- Fluorescent Black Lights
- Circline Fluorescent
- Miniature T5 Tubes
- Germicidal Fluorescent Tubes
- Fluorescent Grow Bulbs
- T5 Fluorescent Bulbs
- Studioline Products
- T12 High Output Fluorescent Lamps
- T12VHO Fluorescent Lamps
- T6 Fluorescent Tubes
- Weather Shielded Jacketed Lamps
- Four Foot T12 Tubes
- T12 Tubes Under 48 Inches
- U Bent T12 Tubes
- T12 Tubes Over 48 Inches
- T8 Tubes Under 48 Inches
- 4 Foot T8 Tubes
- T8 Tubes Over 48 Inches
- U Bent T8 Tubes
- Miscellaneous T8 Tubes
- TLD Fluorescent Tubes
- T10 Linear Fluorescent Tubes
- Fluorescent Tubes for Meat Display
- Red, Yellow, Blue and Green Fluorescent Tubes

Sylvania Pentron 28 Watt 2700K T5 Fluorescent Bulb, Miniature Bi-pin Base



Product Name: FP28/827
Product #: 20975
Manufacturer: Sylvania
Unit of Measure: Each (1)
Our Price/Unit: \$15.00
Quantity of Units/Case: 40
Minimum Quantity of Cases to Order: 1

*Image Accuracy Not Guaranteed



[Safety Data Sheet](#)
[Printable Page](#)

[Specifications](#) | [Product Info](#) | [Accessories](#) | [Review](#)

Abbrev. With Packaging Info.: FP28827 40/CS 1/SKU
Actual Length (in): 45.8
Actual Length (mm): 1163.2
Average Rated Life (hr): 20000
Base: Miniature Bipin
Bulb: T5
Color Rendering Index (CRI): 85
Color Temperature/CCT (K): 2700
Diameter (in): 0.67
Diameter (mm): 17.0
Family Brand Name: Pentron
Initial Lumens at 25C: 2600
Initial Lumens at 35C: 2900
Mean Lumens at 25C: 2470
Mean Lumens at 35C: 2755
Nominal Length (in): 48
Nominal Wattage (W): 28
Ordering Abbreviation: FP28/827
Value Added Product: YES

SYLVANIA 24" T8 LINEAR FLUORESCENT STRIP

[RELATED SECTION 26 51 13]

[RELATED SECTION 26 56 00]

Model Number: 22405

Location: Core Hallway Skylight

Dimensions:

Length: 24"

Features:

Lamp application: fluorescent

Base: medium bi pin

Color temperature: 3,000 Kelvins

Lumens: 1200

CRI: 85

Electrical:

Wattage: 15 W

Efficiency:

Rate life: 20,000 hrs

Available: Lowes



OCTRON® 800 XP® SUPERSAVER® ECOLOGIC®3 EXtended Performance Fluorescent Lamps



The OCTRON 800 XP SUPERSAVER T8 fluorescent offering includes a full complement of lengths and wattages, ensuring there is an energy-saving lamp to satisfy nearly all applications. These lamps operate on standard T8 instant start systems and provide up to 22 percent energy savings over 32 Watt lamps. At 11¢/kWh and 4000 hours of operation per year, the 22 percent energy savings translate to a savings of \$12.32 per fixture per year for a 4-lamp fixture. The initial lumen output, lumen maintenance and high color rendering of the OCTRON 800 XP SUPERSAVER/ECO3 lamps help ensure that lighting quality is maintained while energy is saved. These lamps pass the Federal TCLP test, classifying them as non-hazardous waste in most states and feature lead-free glass, bases and manufacturing process, reducing overall environmental impact.

For optimal performance and system warranty, pair with QUICKTRONIC® electronic ballast systems.

Key Features & Benefits

- Energy savings compared to standard 32W T8 lamp
 - 22% with the 25W XP®/SS
 - 12% with the 28W XP®/SS
 - 6% with the 30W XP®/SS
- 94% mean lumens
- Lead free
- Made in the USA
- Dimmable (see application note 5)
- TCLP and RoHS compliant
- Retrofit lamp for existing T8 instant start systems
 - 40,000 hours rated life @ 12 hours per start
- Increased life on SYLVANIA QUICKTRONIC® PROstart® PSX and PSN programmed rapid start ballasts
 - 42,000 hours rated life @ 12 hours per start
- QUICK60+® system warranty when lamps are paired with QUICKTRONIC electronic ballasts

SYLVANIA OCTRON ECOLOGIC3 T8 fluorescent lamps pass the Federal Toxic Characteristic Leaching Procedure (TCLP) criteria for classification as non-hazardous waste in most states*.

ECOLOGIC3 represents a more comprehensive approach to sustainability encompassing high efficiency, long life and RoHS/TCLP compliance.

1. TCLP test results are based on NBMA LL Series standards and are available on request.
2. Lamp disposal regulations may vary; check your local & state regulations.



Product Offering

| Lamp Type | Wattage | CCT |
|---------------------------|---------|----------------------------|
| F017/15W/800XP/SS/ECO3 | 15 | 3000K, 3500K, 4100K, 5000K |
| F025/21W/800XP/SS/ECO3 | 21 | 3000K, 3500K, 4100K, 5000K |
| F032/25W/800XP/SS/ECO3 | 25 | 3000K, 3500K, 4100K, 5000K |
| F028/800XP/SS/ECO3 | 28 | 3000K, 3500K, 4100K, 5000K |
| F030/800XP/SS/ECO3 | 30 | 3000K, 3500K, 4100K, 5000K |
| F032/25W/800XP/XL/SS/ECO3 | 25 | 3000K, 3500K, 4100K |
| F028/800XP/XL/SS/ECO3 | 28 | 3000K, 3500K, 4100K, 5000K |
| F096/50W/800/XP/SS/ECO3 | 50 | 3500K, 4100K, 5000K |
| F096/54W/800/XP/SS/ECO3 | 54 | 3500K, 4100K, 5000K |

Application Information

Applications

- Cove
- Direct/indirect luminaires
- Recessed troffers
- Schools
- Valance

Application Notes

1. F025, F028 and F030 SUPERSAVER lamps are recommended to be used on F32T8 instant start ballast with minimum open circuit voltage of 550V RMS at the lamp.
 - a. Electronically ballasted fixture configurations which operate lamps remotely, such as Master/Satellite applications, can cause reduction of lamp open circuit voltage, in the remote fixture, below the minimum required for reliable lamp starting. For more information, please call 1-800-LIGHTBULB and ask for Ballast Technical Assistance or call your fixture manufacturer.
 - b. Not recommended to be used: (1) in remotely ballasted fixtures with lamp open circuit voltages below 550V, (2) in air handling fixtures, (3) on low power factor ballasts or (4) inverter operated emergency lighting systems unless any of the above equipment is specifically listed for SUPERSAVER (SS) lamps. Any of the above situations could result in lamp starting and stabilization problems, or system compatibility issues.
2. F096 SUPERSAVER lamps are recommended to be used on F96T8 instant start ballast with minimum open circuit voltage of 725V.
3. If a 28W SUPERSAVER lamp is exposed to drafts or the ambient temperature falls below 60°F (70°F for 25W), striation (a rhythmic pulsing pattern of light running down the tube) and/or reduction in lamp brightness may occur. While visually disconcerting, neither behavior is damaging to the lamp and removing the cause (draft or temperature) will return the lamp to normal operation.
4. Fixture must conform to ANSI C78.81-2006 requirements for luminaire design.
5. F096 types are not dimmable. For all other types, contact OSRAM SYLVANIA for approved dimming ballasts.



| | |
|----------------------|--|
| Fixture Description: | |
| Project/Job: | |
| SYLVANIA lamp: | |
| SYLVANIA ballast: | |
| Notes: | |

Ordering Information

| Item Number | Ordering Abbreviation | Watts | Nominal Length (in) | Initial Lumens | Mean Lumens ¹ | Lumens per Watt | Average Rated Life | | | | CCT | CRI |
|------------------------------------|---------------------------|-------|---------------------|----------------|--------------------------|-----------------|--------------------|---------------|-------------------|---------------|-------|-----|
| | | | | | | | Instant Start | | Prog. Rapid Start | | | |
| | | | | | | | 3 hrs/ start | 12 hrs/ start | 3 hrs/ start | 12 hrs/ start | | |
| OCTRON® 800 XP® SUPERSAVER® | | | | | | | | | | | | |
| 22405 | F0171 5W/830/XP/SS/ECO3 | 15 | 24 | 1200 | 1130 | 80 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22406 | F0171 5W/835/XP/SS/ECO3 | 15 | 24 | 1200 | 1130 | 80 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22407 | F0171 5W/841/XP/SS/ECO3 | 15 | 24 | 1200 | 1130 | 80 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22408 | F0171 5W/850/XP/SS/ECO3 | 15 | 24 | 1200 | 1130 | 80 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 81 |
| 22394 | F02521W/830/XP/SS/ECO3 | 21 | 36 | 1925 | 1810 | 92 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22395 | F02521W/835/XP/SS/ECO3 | 21 | 36 | 1925 | 1810 | 92 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22396 | F02521W/841/XP/SS/ECO3 | 21 | 36 | 1925 | 1810 | 92 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22397 | F02521W/850/XP/SS/ECO3 | 21 | 36 | 1925 | 1810 | 92 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 81 |
| 22232 | F03225W/830/XP/SS/ECO3 | 25 | 48 | 2500 | 2325 | 100 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22233 | F03225W/835/XP/SS/ECO3 | 25 | 48 | 2500 | 2325 | 100 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22234 | F03225W/841/XP/SS/ECO3 | 25 | 48 | 2500 | 2325 | 100 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22235 | F03225W/850/XP/SS/ECO3 | 25 | 48 | 2500 | 2325 | 100 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 81 |
| 22177 | F028/830/XP/SS/ECO3 | 28 | 48 | 2725 | 2560 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22178 | F028/835/XP/SS/ECO3 | 28 | 48 | 2725 | 2560 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22179 | F028/841/XP/SS/ECO3 | 28 | 48 | 2725 | 2560 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22184 | F028/850/XP/SS/ECO3 | 28 | 48 | 2725 | 2560 | 97 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 81 |
| 22063 | F030/830/XP/SS/ECO3 | 30 | 48 | 2950 | 2680 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 3000K | 85 |
| 22060 | F030/835/XP/SS/ECO3 | 30 | 48 | 2950 | 2680 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 3500K | 85 |
| 22062 | F030/841/XP/SS/ECO3 | 30 | 48 | 2950 | 2680 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 4100K | 85 |
| 22202 | F030/850/XP/SS/ECO3 | 30 | 48 | 2950 | 2680 | 95 | 24,000 | 40,000 | 40,000 | 42,000 | 5000K | 81 |
| OCTRON 800 XP XL SUPERSAVER | | | | | | | | | | | | |
| 22349 | F03225W/830/XP/XL/SS/ECO3 | 25 | 48 | 2400 | 2305 | 96 | 36,000 | 52,000 | 60,000 | 62,000 | 3000K | 85 |
| 22222 | F03225W/835/XP/XL/SS/ECO3 | 25 | 48 | 2400 | 2305 | 96 | 36,000 | 52,000 | 60,000 | 62,000 | 3500K | 85 |
| 22223 | F03225W/841/XP/XL/SS/ECO3 | 25 | 48 | 2400 | 2305 | 96 | 36,000 | 52,000 | 60,000 | 62,000 | 4100K | 85 |
| 21528 | F028/830/XP/XL/SS/ECO3 | 28 | 48 | 2600 | 2495 | 93 | 36,000 | 52,000 | 60,000 | 62,000 | 3000K | 85 |
| 22166 | F028/835/XP/XL/SS/ECO3 | 28 | 48 | 2600 | 2495 | 93 | 36,000 | 52,000 | 60,000 | 62,000 | 3500K | 85 |
| 22167 | F028/841/XP/XL/SS/ECO3 | 28 | 48 | 2600 | 2495 | 93 | 36,000 | 52,000 | 60,000 | 62,000 | 4100K | 85 |
| 22326 | F028/850/XP/XL/SS/ECO3 | 28 | 48 | 2600 | 2495 | 93 | 36,000 | 52,000 | 60,000 | 62,000 | 5000K | 81 |
| OCTRON F086 XP SUPERSAVER | | | | | | | | | | | | |
| 22420 | F086/50W/835/XP/SS/ECO3 | 50 | 96 | 5400 | 5075 | 108 | 24,000 | 36,000 | | | 3500K | 85 |
| 22421 | F086/50W/841/XP/SS/ECO3 | 50 | 96 | 5400 | 5075 | 108 | 24,000 | 36,000 | | | 4100K | 85 |
| 22422 | F086/50W/850/XP/SS/ECO3 | 50 | 96 | 5400 | 5075 | 108 | 24,000 | 36,000 | | | 5000K | 81 |
| 22100 | F086/54W/835/XP/SS/ECO3 | 54 | 96 | 5700 | 5360 | 106 | 24,000 | 36,000 | | | 3500K | 85 |
| 22101 | F086/54W/841/XP/SS/ECO3 | 54 | 96 | 5700 | 5360 | 106 | 24,000 | 36,000 | | | 4100K | 85 |
| 22347 | F086/54W/850/XP/SS/ECO3 | 54 | 96 | 5700 | 5360 | 106 | 24,000 | 36,000 | | | 5000K | 81 |

1. Measured at 40% of rated life.

Ordering Guide

| | | | | | | | | | | |
|-----------------------|--|---|------------------------|---|--|--|---|------------|---|-----------|
| F0 | 30 | / | 8 | 35 | | XP or XL | / | SS | / | ECO3 |
| Fluorescent OCTRON | Actual Wattage 15, 21, 25, 28, 30, 50 and 54 | | Actual CRI 80 or 85 | Color Temperature 30 = 3000K CCT, 35 = 3500K CCT 41 = 4100K CCT, 50 = 5000K CCT | | XP=EXtended Performance XL=EXtreme Life | | SUPERSAVER | | ECOLOGICS |

AMERICAN FLUORESCENT 18" STRIP FIXTURE

[RELATED SECTION 26 51 13]

Model Number: ST115

Location: Main House interior

Finish: white enamel

Dimensions:

Length: 18"

Width: 2-3/4"

Height: 3-3/4"

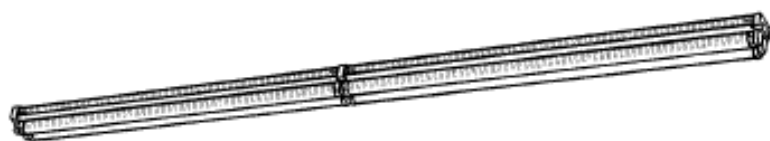
Features:

Pre-heat ballast

Mounting: chain, direct, hung individually or in continuous runs

Available: Lowes





DESCRIPTION

This series of striplights has been designed for residential and light commercial applications. Choose from 15", 18", 24", 36", 48", and 96" lengths in a one lamp model, or 24", 36", 48" and 96" lengths in a two lamp model. A four lamp 48" fixture is also available. All units use T12 lamps.

CONSTRUCTION

Housing, cover and ends are die formed of 22 gauge cold rolled steel. Standard mounting holes and wiring knockouts are included. Can be stem, chain, or direct mounted; and can be hung individually or in continuous runs.

FINISH

Housing interior and exterior are finished in lighting grade white baked gloss enamel paint.

DIFFUSER

There is no diffuser for these fixtures. The fluorescent lamps are exposed.

ELECTRICAL

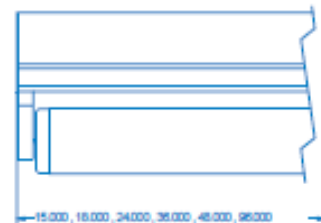
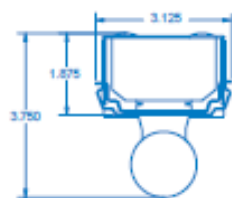
All ES units are wired with U.L. listed high power factor, rapid start, Class P, energy saving (ES) full light output (E) ballasts for 120 volt, 60 hertz A.C. operation. All non-ES units have trigger start normal power factor ballast. All (CW) units have cold weather ballasts with a minimum starting temperature of 0F for standard lamps, ES lamps are not recommended for cold weather applications. Lampholders are rotating lock, medium bi-pin type. All fixtures are U.L. listed.

OPTIONS

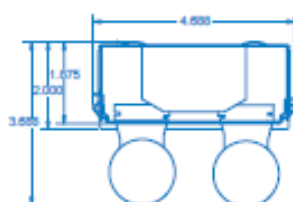
Symmetric and asymmetric reflectors are available (contact factory). For ballast upgrades and options, refer to back of guide. Other voltages, listings, and ratings available on request (contact factory).

STWG1 = one light wire guard

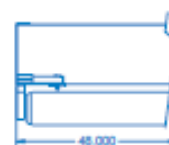
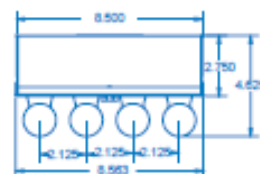
STWG2 = two light wire guard



ST100 Series (1 Light)



ST200 Series (2 Lights)



ST440

ORDERING INFORMATION

| Model No. | Fluorescent Lamps | DIMENSIONS | | | |
|-------------|----------------------|------------|--------|---------|-----------|
| | | L | W | D | Mtg. Ill. |
| ST114RS | (1) T12 15" F14T12 | 15" | 3 7/8" | 3 3/4" | 113 |
| ST115RS | (1) T12 18" | 18" | 3 7/8" | 3 3/4" | 113 |
| ST120RS | (1) T12 24" F17T12 | 24" | 3 7/8" | 3 3/4" | 113 |
| ST130RS | (1) T12 36" | 36" | 3 7/8" | 3 3/4" | 113 |
| ST140RS | (1) T12 48" | 48" | 3 7/8" | 3 3/4" | 113 |
| ST140RSES | (1) T12 48" | 48" | 3 7/8" | 3 3/4" | 113 |
| ST140RSCW | (1) T12 48" | 48" | 3 7/8" | 3 3/4" | 113 |
| ST140-8RSES | (2) T12 48" (Tandem) | 96" | 3 7/8" | 3 3/4" | 132 |
| ST140-8RSCW | (2) T12 48" (Tandem) | 96" | 3 7/8" | 3 3/4" | 132 |
| ST220RS | (2) T12 24" | 24" | 4 1/8" | 3 7/16" | 114 |
| ST230RS | (2) T12 36" | 36" | 4 1/8" | 3 7/16" | 114 |
| ST240RSES | (2) T12 48" | 48" | 4 1/8" | 3 7/16" | 114 |
| ST240-8RSES | (4) T12 48" (Tandem) | 96" | 4 1/8" | 3 7/16" | 133 |
| ST440RSES | (4) T12 48" | 48" | 8 1/8" | 4 3/8" | 43 |



American Fluorescent

2345 N. Ernie Krueger Circle • Waukegan, Illinois 80037
 PH: 847.249.5670 • FAX: 847.249.2878

www.americanfluorescent.com

METALUX 24" UTILITY FLUORESCENT STRIP LIGHT FIXTURE

[RELATED SECTION 26 51 13]

Model Number: SNF-120-LTS-120V-U

Location: Main House interior

Dimensions:

Length: 24"

Width: 3"

Height: 3"

Features:

Utility fluorescent type: strips

Ballast required: yes

Efficiency:

Energy Efficiency: T12

Approval Certificates:

UL Safety Approval

CSA Safety Listing

Available: Lowes

Price: \$16.47



DESCRIPTION

The SNF Series is a functional and multi-purpose narrow strip family that incorporates premium performance and construction durability. Designed with our easy-to-use Flip-Up socket design, the SNF significantly reduces installation time. The performance and application versatility of this series can be increased by incorporating symmetrical or asymmetrical reflectors. The SNF Series can be installed using various mounting methods and numerous options and accessories are available. The small size of the SNF makes it an ideal choice for size-restricted architectural applications. The SNF Series can be the illumination solution in commercial, industrial, retail and residential applications. Fixtures can be used in storage/utility areas, coves, display cases, shops, task and general area lighting.

SPECIFICATION FEATURES

A... Construction

Channel is die formed cold rolled steel with numerous KOs for ease of installation. Groove for Tong Hanger. End plate quickly converts to snap-in channel connector for continuous row alignment. Lamp holder bracket flips in place. Channel/wireway cover secured with quarter-turn fasteners.

B... Electrical*

Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolts. Rotor Lock lampholders. UL/CUL listed. Suitable for damp locations.

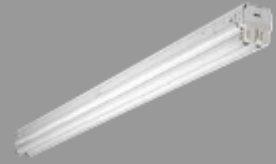
C... Finish

Multistage iron phosphate pre-treatment ensures maximum bonding and rust inhibitor. Lighting upgrade, baked white enamel finish. Prepainted material is standard, PAF optional.

| | | |
|--------------------|--|-------------|
| Catalog # | | Type |
| Project | | |
| Comments | | Date |
| Prepared by | | |

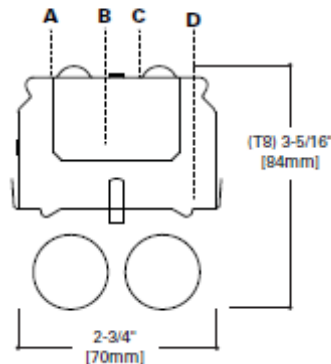
D... Channel/Wireway Cover

Die formed heavy gauge steel. Tight fit for ease of maintenance. Easily removed without use of tools. Optional reflector available incorporating silver technology enhancements (Silver Lining). Consult Pre Sales Technical Support.

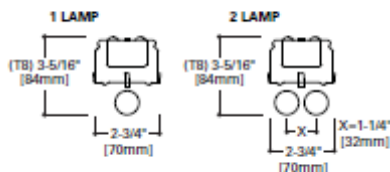


SNF
117, 125
125
128T8, 132
217, 225
228T8, 232

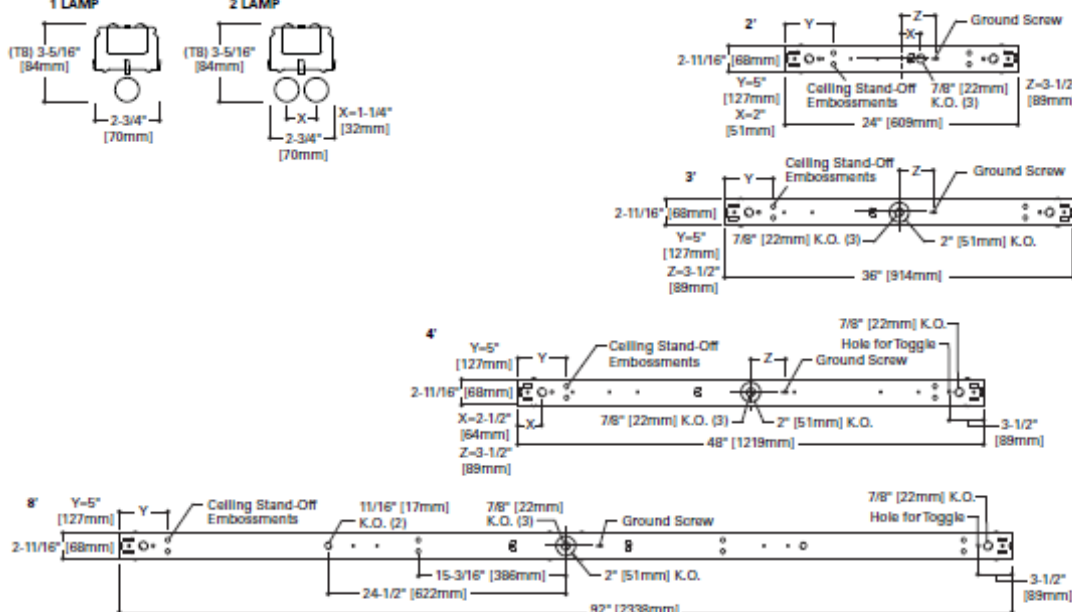
2', 3' OR 4' STRIP
1 OR 2 T8 LAMPS
Narrow Striplite



LAMP CONFIGURATIONS



MOUNTING DATA



ENERGY DATA

Input Watts:

EB Ballasts Normal Ballast Factor
117 (20), 217 (34), 125 (23),
128T8 (28), 132 (31), 225 (53),
228T8 (49), 232 (58)

HB Ballasts Normal Ballast Factor
117 (18), 217 (31), 128T8 (25),
228T8 (48), 132 (28), 232 (53)

EB Ballasts Low Ballast Factor
125 (21), 128T8 (22), 132 (25),
225 (40), 228T8 (44), 232 (48)

Luminaire Efficacy Rating
LER = FS-85

Catalog Number: SNF-132

Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$2.82

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements. † One lamp only.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

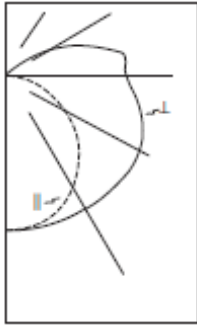
LINEAR DISCONNECT

Safe and convenient means of disconnecting power.

ADF081660



PHOTOMETRICS



SNF-132
Electronic Ballast
F32T8/35K Lamps
2900 Lumens

Spacing criterion:
(II) 1.2 x mounting
height, (L) 1.5 x
mounting height

Efficiency 93.4%

Test Report:
SN132.IES

LER = FS-85

Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$2.82

Coefficients of Utilization

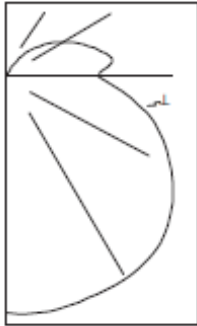
| rc | Effective floor cavity reflectance | | | | | | | | | | | | | | | | | |
|-----|------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| | 80% | | | | 70% | | | | 20% | | | | | | | | | |
| rw | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 107 | 107 | 107 | 107 | 102 | 102 | 102 | 102 | 94 | 94 | 94 | 86 | 86 | 86 | 79 | 79 | 79 | 76 |
| 1 | 94 | 89 | 84 | 79 | 90 | 85 | 80 | 76 | 77 | 74 | 70 | 71 | 68 | 65 | 64 | 62 | 60 | 57 |
| 2 | 84 | 75 | 68 | 61 | 80 | 72 | 65 | 59 | 66 | 60 | 55 | 60 | 55 | 51 | 54 | 51 | 48 | 44 |
| 3 | 76 | 65 | 57 | 50 | 72 | 62 | 55 | 48 | 57 | 51 | 45 | 52 | 47 | 42 | 47 | 43 | 39 | 36 |
| 4 | 69 | 57 | 48 | 41 | 66 | 55 | 47 | 40 | 50 | 43 | 38 | 46 | 40 | 35 | 42 | 37 | 33 | 30 |
| 5 | 63 | 50 | 41 | 34 | 60 | 48 | 39 | 33 | 44 | 37 | 31 | 40 | 34 | 29 | 37 | 31 | 27 | 25 |
| 6 | 58 | 44 | 35 | 29 | 55 | 43 | 34 | 28 | 39 | 32 | 27 | 36 | 30 | 25 | 33 | 27 | 23 | 21 |
| 7 | 53 | 40 | 31 | 25 | 50 | 38 | 30 | 24 | 35 | 28 | 23 | 32 | 26 | 21 | 29 | 24 | 20 | 18 |
| 8 | 49 | 36 | 27 | 21 | 46 | 34 | 26 | 21 | 31 | 24 | 20 | 29 | 23 | 18 | 26 | 21 | 17 | 15 |
| 9 | 45 | 32 | 24 | 18 | 43 | 31 | 23 | 18 | 28 | 21 | 17 | 26 | 20 | 16 | 24 | 19 | 15 | 13 |
| 10 | 42 | 29 | 21 | 16 | 40 | 28 | 21 | 16 | 26 | 19 | 15 | 24 | 18 | 14 | 22 | 17 | 13 | 11 |

Zonal Lumen Summary

| Zone | Lumens | %Lamp | %Fixture |
|--------|--------|-------|----------|
| 0-30 | 391 | 13.5 | 14.4 |
| 0-40 | 662 | 22.8 | 24.5 |
| 0-60 | 1307 | 45.1 | 48.3 |
| 0-90 | 2192 | 75.6 | 81.0 |
| 90-180 | 515 | 17.8 | 19.0 |
| 0-180 | 2708 | 93.4 | 100.0 |

Candela

| Angle | Along II | 45° | Across I. |
|-------|----------|-----|-----------|
| 480 | 481 | 481 | |
| 10 | 474 | 478 | 479 |
| 20 | 448 | 468 | 481 |
| 30 | 405 | 447 | 479 |
| 40 | 347 | 421 | 480 |
| 50 | 278 | 393 | 481 |
| 60 | 201 | 367 | 474 |
| 70 | 120 | 332 | 449 |
| 80 | 44 | 278 | 408 |
| 90 | 2 | 237 | 368 |
| 100 | 2 | 213 | 367 |
| 110 | 2 | 120 | 259 |
| 120 | 2 | 38 | 144 |
| 130 | 3 | 2 | 42 |
| 140 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 |
| 160 | 0 | 0 | 0 |
| 170 | 0 | 0 | 0 |
| 180 | 0 | 0 | 0 |



SNF-232
Electronic Ballast
Two F32T8/35K Lamps
2800 Lumens

Spacing criterion:
(II) 1.2 x mounting
height, (L) 1.5 x
mounting height

Efficiency 90.1%

Test Report:
SNF232.IES

LER = FS-

Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$

Coefficients of Utilization

| rc | Effective floor cavity reflectance | | | | | | | | | | | | | | | | | |
|-----|------------------------------------|-----|-----|-----|-----|----|----|----|-----|----|----|----|----|----|----|----|----|----|
| | 80% | | | | 70% | | | | 20% | | | | | | | | | |
| rw | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 103 | 103 | 103 | 103 | 99 | 99 | 99 | 99 | 90 | 90 | 90 | 83 | 83 | 83 | 76 | 76 | 76 | 72 |
| 1 | 91 | 86 | 81 | 77 | 87 | 82 | 78 | 74 | 75 | 72 | 68 | 68 | 66 | 63 | 62 | 60 | 58 | 55 |
| 2 | 82 | 73 | 66 | 60 | 78 | 70 | 64 | 58 | 64 | 59 | 54 | 58 | 54 | 50 | 53 | 50 | 47 | 44 |
| 3 | 74 | 64 | 55 | 49 | 70 | 61 | 53 | 47 | 55 | 49 | 44 | 51 | 45 | 41 | 46 | 42 | 38 | 35 |
| 4 | 67 | 56 | 47 | 41 | 64 | 53 | 45 | 39 | 49 | 42 | 37 | 44 | 39 | 35 | 41 | 36 | 32 | 30 |
| 5 | 62 | 49 | 41 | 34 | 58 | 47 | 39 | 33 | 43 | 37 | 31 | 40 | 34 | 29 | 36 | 31 | 27 | 25 |
| 6 | 57 | 44 | 36 | 30 | 54 | 42 | 34 | 29 | 39 | 32 | 27 | 36 | 30 | 25 | 33 | 28 | 24 | 22 |
| 7 | 52 | 40 | 31 | 26 | 50 | 38 | 30 | 25 | 35 | 28 | 24 | 32 | 27 | 22 | 30 | 25 | 21 | 19 |
| 8 | 49 | 36 | 28 | 23 | 46 | 35 | 27 | 22 | 32 | 25 | 21 | 29 | 24 | 20 | 27 | 22 | 19 | 17 |
| 9 | 45 | 33 | 25 | 20 | 43 | 32 | 25 | 20 | 29 | 23 | 19 | 27 | 22 | 18 | 25 | 20 | 17 | 15 |
| 10 | 42 | 30 | 23 | 18 | 40 | 29 | 22 | 18 | 27 | 21 | 17 | 25 | 20 | 16 | 23 | 18 | 15 | 13 |

Zonal Lumen Summary

| Zone | Lumens | %Lamp | %Fixture |
|--------|--------|-------|----------|
| 0-30 | 805 | 14.4 | 16.0 |
| 0-40 | 1364 | 24.4 | 27.0 |
| 0-60 | 2638 | 47.1 | 52.3 |
| 0-90 | 4049 | 72.3 | 80.3 |
| 90-180 | 993 | 17.7 | 19.7 |
| 0-180 | 5043 | 90.1 | 100.0 |

Luminance Data

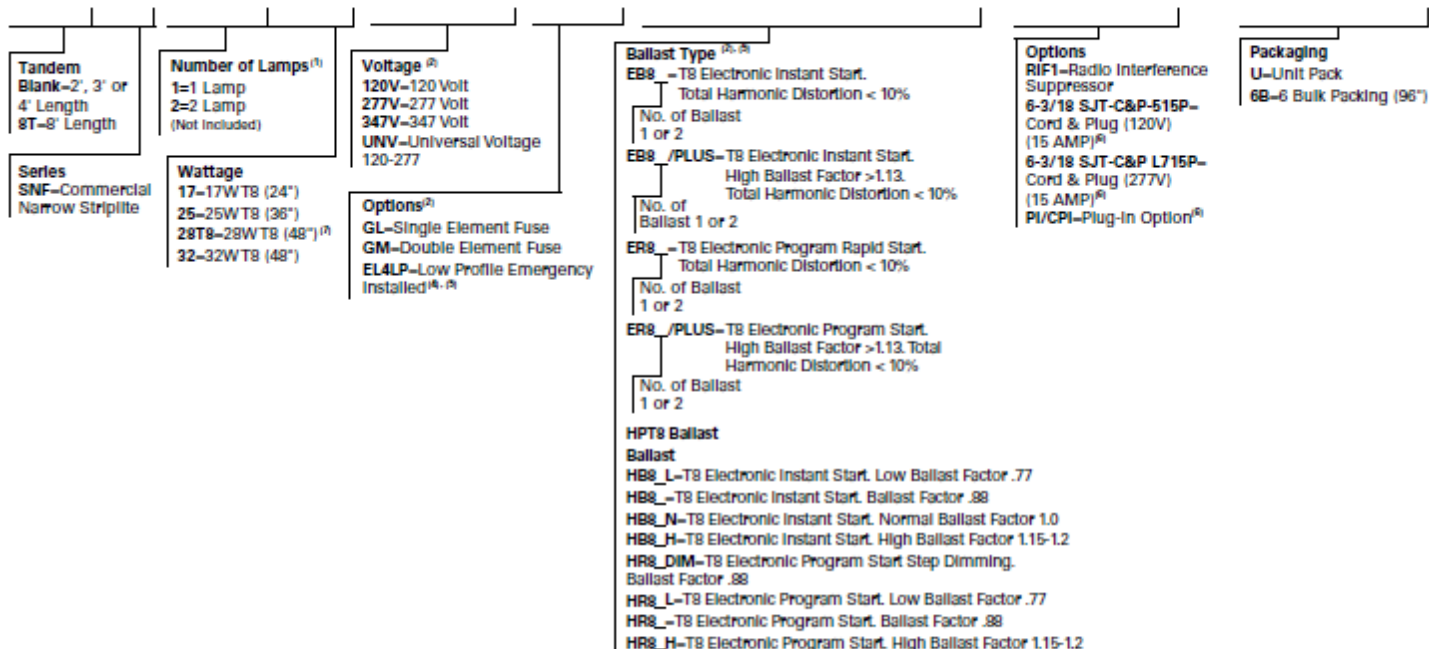
| Angle In Deg | Average 0-Deg cd/sm | Average 45-Deg cd/sm | Average 90-Deg fcd/sm |
|--------------|---------------------|----------------------|-----------------------|
| 45 | 13624 | 17577 | 20140 |
| 55 | 12829 | 19375 | 22766 |
| 65 | 11676 | 22113 | 27282 |
| 75 | 9619 | 28523 | 36952 |
| 85 | 5173 | 56907 | 82706 |

Candela

| Angle | Along II | 45° | Across I. |
|-------|----------|-----|-----------|
| 0 | 989 | 989 | 989 |
| 10 | 974 | 986 | 991 |
| 20 | 924 | 958 | 989 |
| 30 | 835 | 918 | 995 |
| 40 | 716 | 868 | 982 |
| 50 | 572 | 797 | 921 |
| 60 | 413 | 689 | 829 |
| 70 | 248 | 563 | 715 |
| 80 | 92 | 412 | 566 |
| 90 | 1 | 272 | 420 |
| 100 | 1 | 304 | 490 |
| 110 | 0 | 240 | 410 |
| 120 | 1 | 179 | 325 |
| 130 | 1 | 121 | 235 |
| 140 | 2 | 66 | 149 |
| 150 | 2 | 18 | 69 |
| 160 | 3 | 2 | 9 |
| 170 | 3 | 2 | 0 |
| 180 | 2 | 2 | 2 |

ORDERING INFORMATION

SAMPLE NUMBER: SNF-232-UNV-EB81-U



NOTES: ⁽¹⁾2 lamps T8 only. ⁽²⁾Products also available in non-US voltages and frequencies for international markets. ⁽³⁾For SilverLining reflector add SS in Catalog Number, Example: SNF-ASY-SS-4. ⁽⁴⁾Not available for 2' version. ⁽⁵⁾Maximum width clearance for ballast in channel is 2-7/32". ⁽⁶⁾Socket brackets left uninstalled. ⁽⁷⁾When utilizing 28W T8 lamps, HPT8 Ballast must be specified. Other ballast restrictions may apply. Consult your Cooper Lighting Representative for availability and ordering information.

Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

ACCESSORIES

(Order Separately)

AYC-Chain/Set—36" Chain Hanger (Use 1 Set Per Fixture)
SCF—Fixed Stem Set (Specify Length)
SCS—Swivel Stem Set (Specify Length)
SCA—Adjustable 48" Stem Set
EYE-CHAIN/SET-B—Eye Bolt Chain (Use 1 Set Per Fixture)
SNF-ASY-4⁽¹⁾—3" Asymmetric Reflector (Specify 2', 3' or 4')
SNF-SYM-4⁽²⁾—6" Symmetric Reflector (Specify 2', 3' or 4')
SNF-REV-4⁽³⁾—Reverse Asymmetric Reflector (Specify 2', 3' or 4')
WG/SNF-2FT—2' Wire Guard
WG/SNF-3FT—3' Wire Guard
WG/SNF-4FT—4' Wire Guard
A1B/Spacer-U—Spacer 1-1/2" to 2-1/2" from ceiling (Use 2 Per Fixture)
TOGGLE—Single Toggle NO. 2 (Specify Length)
Y-TOGGLE—Y Toggle NO. 2 (Specify Length)

(Additional Accessories Available. See Options and Accessories Section.)

SHIPPING INFORMATION

| Catalog No. | Wt. |
|-------------|---------|
| SNF-117 | 5 lbs. |
| SNF-217 | 5 lbs. |
| SNF-125 | 6 lbs. |
| SNF-225 | 6 lbs. |
| SNF-132 | 12 lbs. |
| SNF-232 | 12 lbs. |
| SNF-128T8 | 12 lbs. |
| SNF-228T8 | 12 lbs. |
| 8TSNF-132 | 14 lbs. |
| 8TSNF-232 | 14 lbs. |

BIRCHWOOD LIGHTING BRANDI 48"

[RELATED SECTION 26 51 13]

Model Number: BRA T8 TDEC ACC 120 EB 132 BK AS

Location: Core Bath Vanity

Dimensions:

Length: 20-1/4"

Width: 13-3/8"

Depth: 6-1/2"

Features:

Application: wall mounted fixture

Aperture: 2-1/2" x 4-1/2"

Lamp: 48" Linear Fluorescent Strip

Available: Birchwood Lighting



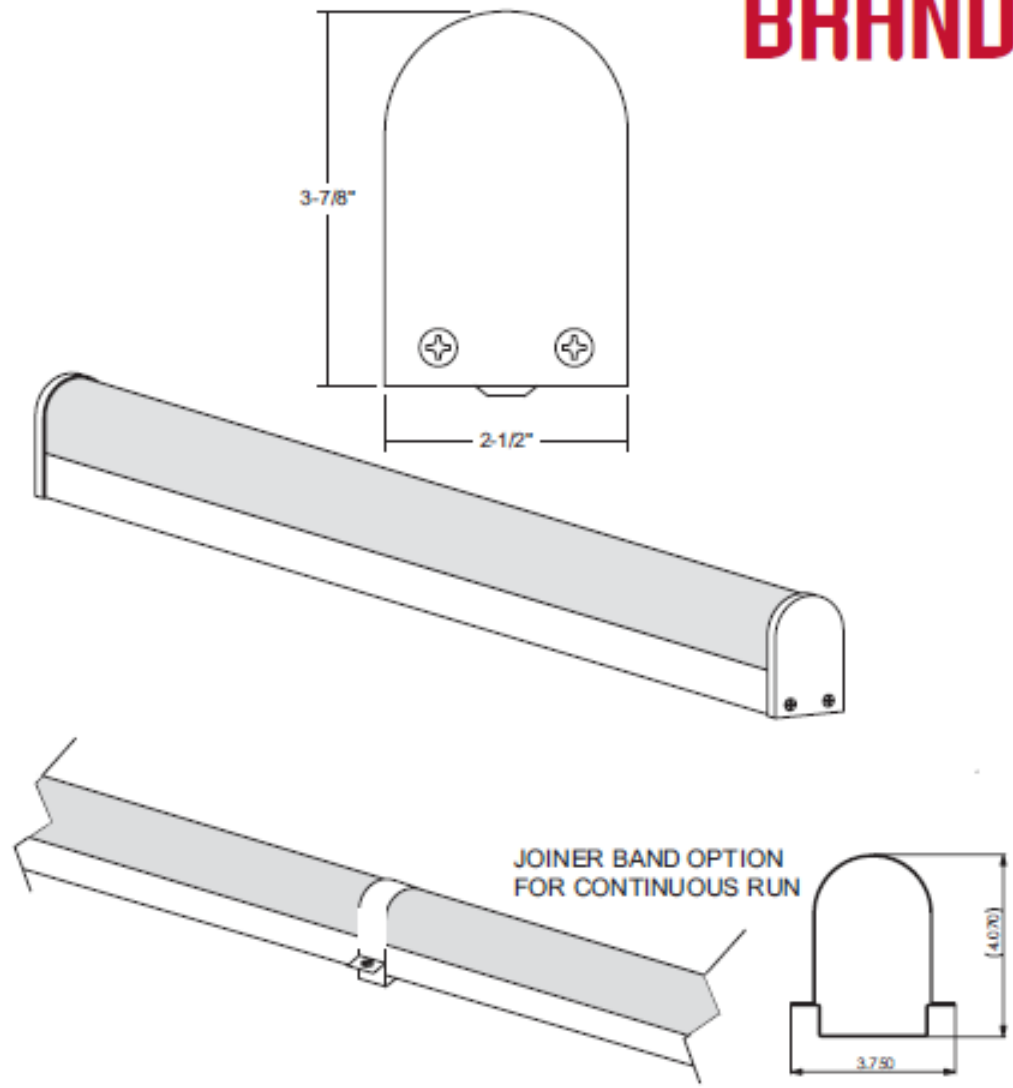
BRANDI™

BRA-T5-TDEC
 BRA-TSHO-TDEC
 BRA-T8-TDEC

TEAR DROP END CAP
 WET LOCATION

T5, TSHO or T8 LINEAR LAMP

- 18 gauge steel construction
- milled aluminum end caps for precise fit
- fixtures are available in nominal lengths of 2, 3, 4 and 5 feet. see part numbers to the right for actual fixture lengths
- single T5, TSHO or T8 fluorescent, other lamp types available (consult factory)
- variety of acrylic lens shapes, materials and finishes available (consult factory)
- standard ballasts are integral electronic, consult Options p5 for available types of dimming and emergency ballasts
- powder coat done post production for strong rust inhibiting protection
- standard finish is Anodized Silver other finishes are also available
- surface or pendant mount
- UL and C-UL Listing for Wet Locations



Job Information

Type

Job Name

Location

| | | | | | | | | | |
|------------------|-------------------------------|-----------------------------------|------------------------------|--|---|---|---|---|---------|
| BRA | TDEC | | | | | | | | |
| Family BRANDI | Lamp Type T5 TSHO T8 | Model TDEC - Tear Drop End Cap | Voltage 120 277 347 | Ballast EB - electronic DIM__ - dimming* EM__ - emergency* *refer to Options p5 for DIM__ and EM__ options code. fixture size may need to be adjusted. | Length RUN- Continuous Run** (specify run length) | Finish AS - Anodized Silver HRW - High Reflectivity White CU - Custom (please specify) | STAND ALONE UNITS T5 114 - 23 1/2" 121 - 35 3/8" 128 - 47 1/8" 135 - 59" TSHO 124 - 23 1/2" 139 - 35 3/8" 154 - 47 1/8" 160 - 59" T8 117 - 25 1/8" 125 - 37 1/8" 132 - 49 1/8" 140 - 61" | FEED POINT BK - fitting on back 1END - fitting on one end of fixture only 2END - fitting on both ends of fixture CU - custom feed point (please specify) PDMT - slim pendant mount 24" stem standard consult the factory for other available conduit or power feed options. | Options |

**Note: Must specify RUN for continuous mounting. Stand Alone units cannot be configured for continuous runs



DELRAY LIGHTING 48" LINEAR FIXTURE

[RELATED SECTION 26 51 13]

Model Number: SW54128.11

Location: Core Bath Vanity

Dimensions:

Length: 48"

Width: 1-3/8"

Height: 4"

Features:

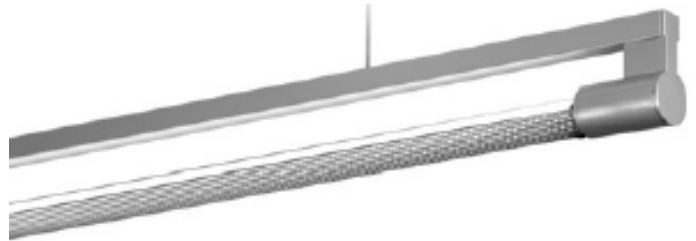
Cast zinc aluminum alloy and aluminum construction

Approval Certificates:

UL Safety Approval

UL for Damp Locations

Available: Lowes



4' 54W

1-54W T5



SW44154

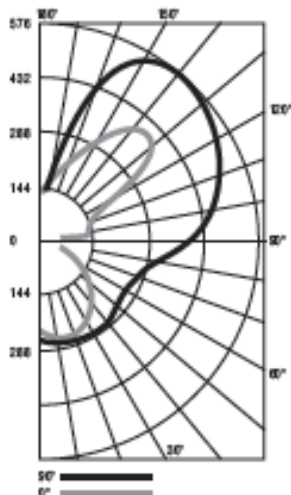
1-54W T5 HO

G5 socket

Total lumens: 5000 mean

Total luminaire efficiency: 72.7%

CP DISTRIBUTION



COEFFICIENTS

| % CEILING 80 (20% FLOOR) | | | |
|--------------------------|----|----|----|
| % WALL | 70 | 50 | 30 |
| 0 | 75 | 75 | 75 |
| 1 | 66 | 62 | 58 |
| 2 | 59 | 53 | 48 |
| 3 | 54 | 46 | 40 |
| 4 | 49 | 40 | 34 |
| 5 | 45 | 36 | 29 |
| 6 | 41 | 32 | 25 |
| 7 | 38 | 28 | 22 |
| 8 | 35 | 26 | 20 |
| 9 | 32 | 23 | 18 |
| 10 | 30 | 21 | 16 |

SWING CONSTRUCTION

- Cast zinc aluminum alloy and aluminum extrusion construction.
- G5 twist-in lamp holders.
- UL /cUL listed for damp locations.
- Universal standard output 120/277V, 50/60 Hz electronic ballast, in a remote housing.
- Back plate has $\frac{7}{8}$ " opening for direct conduit feed.

SINGLE LAMP PENDANT

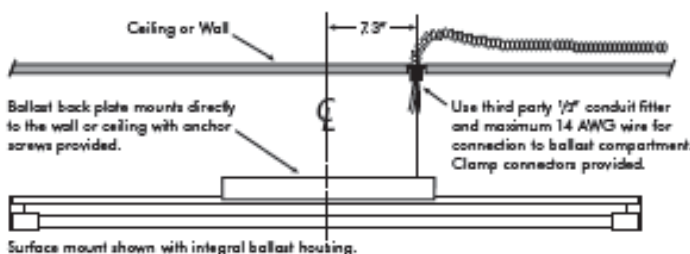
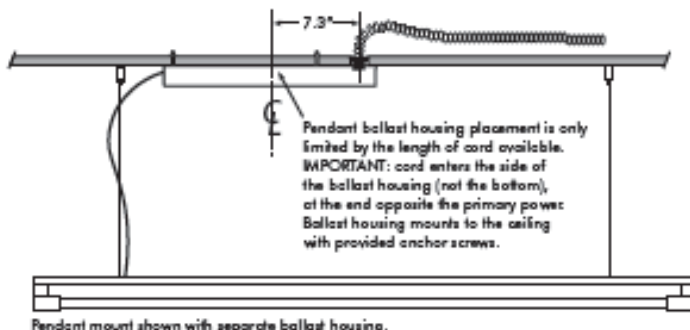
- 8 ft. field-adjustable air craft cable suspension, with push button glider.
- Adjustable 8' gray 600V, 18/5 AWG power cords.
- Dimming and emergency battery available.

SINGLE LAMP SURFACE

- Integral universal standard output 120/277V, 50/60 Hz electronic ballast.
- Back plate has *threaded* $\frac{7}{8}$ " opening for direct 1/2" conduit feed.
- Dimming and EM not available.

MOUNTING - SW4 AND SW5 SERIES

Swing features a die cast backplate with a threaded $\frac{1}{2}$ " conduit fitting at one end for direct connection to flexible conduit, which provides the smallest ballast compartment profile and avoids unsightly plates or covers on walls or ceilings. Use a third party $\frac{1}{2}$ " conduit fitting and maximum 14 AWG wire for communication to the ballast. Detailed installation instructions are available at www.delraylighting.com.



NOTE: POWER DOES NOT ENTER AT THE CENTER

J-BOX MOUNT

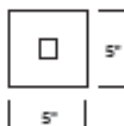
Mounting the SW4 and SW5 series with standard ballast housing to a recessed J-box requires a 3" mud ring, the holes in line with the direction of the fixture. Order SW200, available in S-silver or W-white.



BALLAST HOUSING BOX COVER

Order S100P to mount ballast to a recessed J-box. For use with the following options:

- SEM13
- Dimming

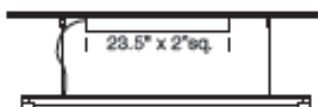


OPTIONS

DIMMING BALLASTS

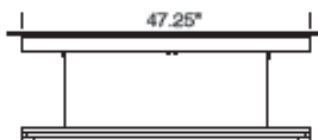
Dimming ballast replaces standard canopy. All ballasts require compatible dimmers. *Note:* pendant distance should not exceed 3 feet. Voltage must be specified.

| Cat. # | Type | Wattage |
|--------|--------------------|---------|
| SD1 | Lutron Eco 10 | 28/54 |
| SD3 | Advance Mark X | 54 |
| SD5 | Advance Mark VII | 54 |
| SD8 | Lutron Hi Lume FDB | 28/54 |



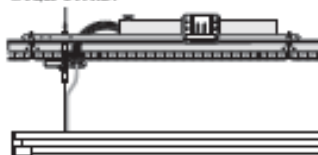
EMERGENCY BALLASTS

Emergency ballast provides 1300 lumens for 90 minutes. Charge indicator light and test switch visible from below. (Remote test switch available.) Emergency not available for the SW5 series. Voltage must be specified. Order SEM13.



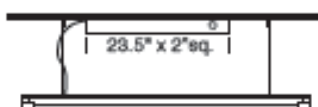
RECESSED BALLAST

For suspended ceilings only. Order SWRB.



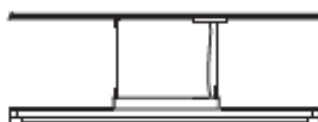
THRU WIRING

Replaces standard ballast canopy and dimming canopy. Allows up to $\frac{1}{2}$ " conduit with 3-in/3-out, #14 AWG. Order SMB.



SW5-PENDANT MOUNT

Adjustable cable grippers, round power feed canopy, and 8' cable and power cord included. (Cable and power cord may be ordered any length). Order SW5PS-silver or SW5PW-white.



GENERAL ELECTRIC 24" T8 LINEAR FLUORESCENT

[RELATED SECTION 26 51 13]

Model Number: 64234

Location: OM Closets, Outdoor Kitchen Mechanical Closet, Electrical Closet

Dimensions:

Length: 24"

Features:

1-pack

Rapid start

Lumens: 1050

Color temperature: 4100 Kelvins

Base type: Plug-In

Plug-in type: Medium Bi-pin

Can be used indoors or enclosed outdoor use

Electrical:

Wattage: 18 W

Efficiency:

Rate life: 7500 hrs

Available: Lowes

Cost: \$6.48





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GE 18-Watt T8 24" Fluorescent Light Bulb

Item #: 148092 | Model #:64234

★★★★★ Be the first to write a review!

\$6.48

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GE 17-Watt T8 24" Fluorescent Light Bulb

Not Yet Rated

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GE 17-Watt T8 24" Fluorescent Light Bulb

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Utilitech 24" 2-Light Utility Fluorescent...

★★★★★

\$19.94

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|-----------------------|---------|-----------------------------|---|
| Bulb Wattage | 18.0 | Plug-In Type | Medium bi pin |
| ENERGY STAR Qualified | No | Package Quantity | 1.0 |
| Energy Efficient | No | Rated Life (Hours) | 7500.0 |
| Rapid Start | Yes | Indoor/Outdoor | For indoor or enclosed outdoor use only |
| Lumens | 1050.0 | Tube Type | Linear |
| Dimmable | No | Light Color | Cool white |
| Base Type | Plug-in | Color Temperature (Kelvins) | 4100.0 |

GENERAL ELECTRIC LIGHTING LED FLOOD LIGHT**[RELATED SECTION 26 56 00]**

Model Number: 71776

Location: on top of OM Closets and Flex OM

Dimensions:

Diameter: 4"

Length: 5"

Features:

Light color: soft white

Color temperature: 2700 Kelvins

Energy efficient

Bulb shape: PAR38

Wattage equivalent: 90W

For indoor/outdoor use

Lumens: 1,300

Base type: medium

Electrical:

Wattage: 26 W

Efficiency:

Rate life: 10,000 hrs

Approval Certificates:

Energy Star Qualified

UL Safety Approval

Available: Lowes

Price: \$9.24





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GE 90-Watt Equivalent Indoor/Outdoor Compact Fluorescent Flood Light Bulb (ENERGY STAR)

Item #: 111018 | Model #:71776

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\$9.24

Customers Also Viewed



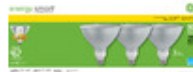
Bright Effects 2-Pack 90-Watt Equivalent...

★★★★★
\$16.14



GE 3-Pack 90-Watt Equivalent Indoor/Outdoor...

Not Yet Rated
\$18.98



GE 3-Pack 90-Watt Equivalent Indoor/Outdoor...

★★★★★
\$18.98



GE 4-Pack 65-Watt Equivalent Indoor Compact...

★★★★★
\$44.98

[Description](#) | [Specifications](#) | [Info & Guides](#) | [Reviews](#) | [Q&A](#)

| | | | |
|-----------------------------|------------|--------------------|------------------------|
| CFL Bulb Wattage | 26.0 | UL Safety Listing | Yes |
| Rapid Start | No | Wattage Equivalent | 90.0 |
| Light Color | Soft white | CSA Safety Listing | No |
| Color Temperature (Kelvins) | 2700.0 | ETL Safety Listing | No |
| ENERGY STAR Qualified | Yes | Dimmable | No |
| Energy Efficient | Yes | Package Quantity | 1.0 |
| Plug-In Type | N/A | Indoor/Outdoor | For indoor/outdoor use |
| Bulb Shape | PAR38 | Rated Life (Hours) | 10000.0 |
| Bulb Length (Inches) | 5.0 | Lumens | 1300.0 |
| Bulb Diameter (Inches) | 4.0 | Base Type | Medium |

LIGHTING EVER LED FLEXIBLE LIGHTING STRIPS

[RELATED SECTION 26 56 00]

Model Number: 3258-SMD-LED

Location: within columns on the Great Porch

Dimensions:

Length: 16-3/8'

Features:

Color: cool white

Temperature: 4800-5200 K

LED sources: 3528 SMD LED

LED quantity: 300 units per roll

Beam angle: 120°

Available: Lighting Ever



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Product Description

This item is non-waterproof LED strip. 300 units 3528 SMD LED per roll(16.4ft/5M). White color. It can work for indoor decoration, cove lighting, mood lighting, shopping mall decoration and so on.

Specification

| | |
|---------------------|-------------------------|
| Color | Cool White (4800-5200K) |
| LED Sources | 3528 SMD LED |
| LED Quantity | 300 Units Per Roll |
| Length | 16.4 ft (5 meters) |
| Beam Angle | 120 Degree |
| Warranty | 24 Months |

HADCO FLOODLIGHT FIXTURE

[RELATED SECTION 26 56 00]

Model Number: BW4 AS

Location: on top of OM Closets and Flex OM

Dimensions:

Diameter: 6-1/4"

Length: 16-1/2"

Height: 2-1/4"

Finish: Powder coat white

Features:

Rating: dry/damp/wet location

Lamp type: PAR38 MH med base

Transformer ballast included

Mounting: 1/2" NPS thread

Electrical:

Wattage: 100 W maximum

Approval Certificates:

UL Safety Approval

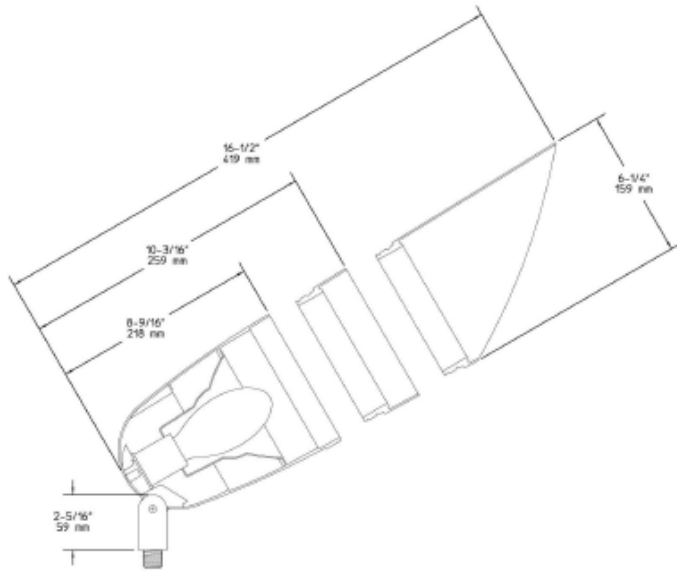
CSA Safety Listing

Available: Philips Hadco



HID Aluminum Bullyte (B_4) Specification Sheet

| | | |
|---------------|--------------|--------------------|
| Project Name: | Location: | MFG: Philips Hadco |
| Fixture Type: | Catalog No.: | Qty: |



Ordering Guide

Example: B_4 N A S

| Product Code | B_4 | HID Aluminum Bullyte | |
|--------------|-----|----------------------|----|
| Reflector | N | Narrow Reflector | *1 |
| | W | Wide Reflector | *1 |
| Finish | A | Black | |
| | H | Bronze | |
| Shroud | S | Short Shroud | |
| | L | Long Shroud | |

*1 Reflector type to be identified between the B and the 4 of product ordering guide. (example BN4).

Specifications

HOUSING:

Die-cast aluminum. Fully-adjustable swivel arm with vibration-proof locking teeth. Gasketing is silicone. Fasteners are 300 series stainless steel. Fully rotatable shroud, gasketed die-cast brass. Shroud is optional. 1/2" NPS male threads to screw onto accessory mounting stake or junction box, sold separately.

FINISH:

Thermoset polyester powdercoat is electrostatically applied after a five-stage conversion cleaning process and bonded by heat fusion thermosetting.

OPTICAL ASSEMBLY:

Clear tempered flat glass lens.

LAMPING:

150W maximum PAR38/R40 incandescent lamp. HID PAR38 MH or MV acceptable with remote ballast (not included). 150 watt maximum HID lamp. Lamp is not included. Lower wattage lamps are acceptable.

ELECTRICAL ASSEMBLY:

4kv rated medium base porcelain socket. Nickel-plated screw shell with center contact.

BALLAST:

Must order inground (IBH) or above ground (ABH) ballast housing separately.

CERTIFICATIONS:

Manufactured to ISO 9001:2008 Standards. ETL listed to U.S. safety standards for wet locations. cETL listed to Canadian safety standards for wet locations.

WARRANTY:

Three-year limited warranty.

Height :

2 5/16" (59mm)

Width:

6 1/4" (159mm)

Length:

16 1/2" (419mm)

Max. Weight:

8.15 lb.

BIRCHWOOD LIGHTING 24" WET LOCATION LUMINAIRE

[RELATED SECTION 26 56 00]

Model Number: BRA T8 TDEC ACC 120 EB 117 BK AS

Location: OM Closets, Outdoor Kitchen Mechanical Closet, Electrical Closet

Dimensions:

Length: 20-1/4"

Width: 13-3/8"

Depth: 6-1/2"

Features:

Application: wall mounted fixture

Aperture: 2-1/2" x 4-1/2"

Lamp: 24" Linear Fluorescent Strip

Available: Birchwood Lighting



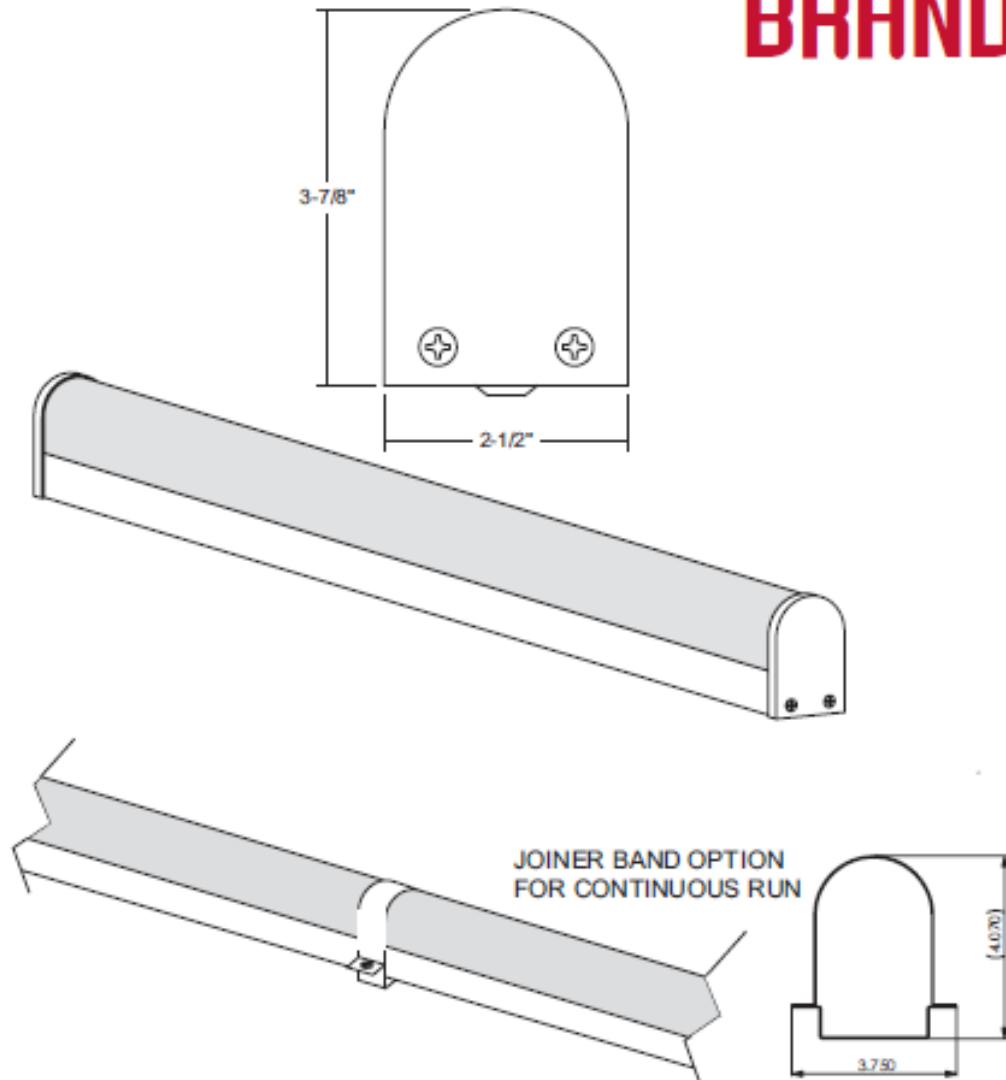
BRANDI™

BRA-T5-TDEC
BRA-TSHO-TDEC
BRA-T8-TDEC

TEAR DROP END CAP
WET LOCATION

T5, TSHO or T8 LINEAR LAMP

- 18 gauge steel construction
- milled aluminum end caps for precise fit
- fixtures are available in nominal lengths of 2, 3, 4 and 5 feet. see part numbers to the right for actual fixture lengths
- single T5, TSHO or T8 fluorescent, other lamp types available (consult factory)
- variety of acrylic lens shapes, materials and finishes available (consult factory)
- standard ballasts are integral electronic, consult Options p5 for available types of dimming and emergency ballasts
- powder coat done post production for strong rust inhibiting protection
- standard finish is Anodized Silver other finishes are also available
- surface or pendant mount
- UL and C-UL Listing for Wet Locations



Job Information

Type

Job Name

Location

| | | | | | | | | |
|------------------|-------------------------------|-----------------------------------|---|------------------------------|---|--|--|---------|
| BRA | TDEC | | | | | | | |
| Family BRANDI | Lamp Type T5 TSHO T8 | Modal TDEC - Tear Drop End Cap | Acrylic ACSIW - Satin Ice Frosted White (54% transmission) ACSIC - Satin Ice Frosted Clear (92% transmission) ACC - Smooth Clear (95% transmission) <i>*consult factory for other acrylic lens options.</i> | Voltage 120 277 347 | Ballast EB - electronic DIM___ - dimming* EM___ - emergency* <i>*refer to Options p5 for DIM___ and EM___ options code. fixture size may need to be adjusted.</i> | Length RUN - Continuous Run** (specify run length) | Finish AS - Anodized Silver HRW - High Reflectivity White CU - Custom (please specify) | Options |
| | | | | | | STAND ALONE UNITS | FEED POINT | |
| | | | | | | T5 114 - 23 1/2" 121 - 35 3/8" 128 - 47 1/8" 135 - 59" | BK - fitting on back 1END - fitting on one end of fixture only 2END - fitting on both ends of fixture CU - custom feed point (please specify) PDMT - stem pendant mount 24" stem standard consult the factory for other available conduit or power feed options | |
| | | | | | | TSHO 124 - 23 1/2" 139 - 35 3/8" 154 - 47 1/8" 180 - 59" | | |
| | | | | | | T8 117 - 25 1/8" 125 - 37 1/8" 132 - 49 1/8" 140 - 61" | | |

**Note: Must specify RUN for continuous mounting. Stand Alone units cannot be configured for continuous runs



BIRCHWOOD LIGHTING

714.550.7118 • fax 714.550.7151 • www.BirchwoodLighting.com

NOTE: Specifications and dimensions are subject to change without notice.

DIVISION 28 **ELECTRONIC SAFETY
AND SECURITY**

FIRST ALERT IONIZATION SMOKE ALARM

[RELATED SECTION 28 31 00]

Model Number: 9120B

Location: Main House and Flex Space

Dimensions:

Length: 5-3/4"

Width: 2-1/4"

Height: 5-1/2"

Weight: 0.61 lb

Color: White

Features:

9V battery backup

75 dBa alarm

Warranty claim: 10 years

Electrical:

Voltage: 120 Vac

Current: 0.04 A

Frequency: 60 Hz

Approval Certificates:

UL Listed

Available: Lowes



▶ Detectors

- ▶ Battery
- ▶ Hardwired
- ▶ Plug-in

▶ Home Security

- ▶ Fire Extinguishing
- ▶ Safes & Cash Boxes
- ▶ Feature

Detectors » Hardwired » Ionization Alarms » **9120B**



9120B
120V AC/DC Smoke Alarm

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SKU#9120B

9120 Series - 22The smoke alarm standard of excellence.
22

The 9120 Series smoke alarms have been designed to install faster 2C perform better and be even smarter than before. These improvements help reduce nuisance alarms and save you time and money.

[Feature](#) | [Spec](#) | [Download](#)

Model #:9120B

- » Sensor: Ionization
- » Warranty Claim: 10-Years
- » Package Type: Box
- » Color: White
- » Battery backup: 9V

Shipping Specs

Individual Package Information

- » Item UPC: 029054513014

- » Packs per case: 12
- » L (inches): 5.690 in
- » W (inches): 2.250 in
- » H (inches): 5.590 in
- » Weight (lb): 0.610 lb

Case Information

- » Case UPC: 100 29054 51301 1
- » Case Length: 14.430 in
- » Case Width: 6.190 in
- » Case Height: 12.630 in
- » Case Weight (lb): 7.900 lb

DCS AIRSENSE INFRARED CARBON DIOXIDE SENSOR**[RELATED SECTION 28 31 00]**

Model Number: 310e

Location: Main House Mechanical Closet

Dimensions:

Length: 5-1/4"

Width: 3-1/4"

Height: 1-3/8"

Features:

Non-dispersive infrared [NDIR]

Gas sampling method: diffusion or sample draw

Measurement range: 0-2000ppm

Repeatability: ± 20 ppm CO₂Measurement accuracy: ± 30 ppm + 2% of reading

5 year recommended calibration interval

Less than 1 minute warm up time

Operating temperature range: 10°C - 50°C

Operating humidity range: 0-95% RH, non-condensing

Single gas calibration

Optional relay contact rating: 2 A @ 24 V

Electrical:

Voltage: 0-10 Vdc

Current: 4-20 mA

Available:



AirSense™ Model 310e Infrared Carbon Dioxide Sensor



Reduce energy cost

Isolated power supply

4-20 mA Current loop

Relay output available



Affordable and Ease of Installation

The **AirSense™** Elite Beam Model 310e CO2 monitor provides continuous, accurate reading of indoor CO2 levels, making it easy to maintain an optimum level of fresh air while reducing heating and cooling costs to an absolute minimum. Use of the **AirSense™** Elite Beam Model 310e enables the building manager to recirculate heated or cooled air, adding outside air only when indoor CO2 levels rise above the set point. Thus "sick building syndrome" and high heating and cooling costs can both be controlled at the same time with the use of the **AirSense™** Elite Beam Model 310e.



Single Gas Smart Calibration

The **AirSense™** Model 310e single gas verification makes field calibration a snap, and its superior design means significantly longer calibration intervals. Unlike other models, its simple user interface has no complicated menus: all maintenance and calibration operations are easily performed even on units with out display.



Easy to install and support.

The **AirSense™** Elite Beam Model 310e is easy to install and support. Measurement output is via a 4 - 20 mA current loop or a 0 to 10 volt interface. A completely isolated power supply eliminates any ground loop or electrical interaction problems when multiple units are connected to the same controller.

| Parameter | Value |
|----------------------------------|---|
| Operating Principle | Non-dispersive infrared (NDIR) |
| Gas Sampling Method | Diffusion or sample draw |
| Measurement Range | 0-2000 ppm (Other Ranges Optional by Request) |
| Repeatability | ± 20 ppm CO2 |
| Measurement Accuracy | ± 30 ppm + 2% of reading |
| Recommended Calibration Interval | 5 year |
| Warm Up Time | Less than 1 minute |
| Power Requirements | 18 - 30 VDC or 18 - 28 VRMS AC |
| Operating Temperature Range | 10 - 50° Celsius |
| Operating Humidity Range | 0 - 95% RH, non-condensing |
| Voltage Output (linear) | 0 - 10 VDC full scale standard. Range field adjustable from 1-10 VDC |
| Current Output (linear) | 4-20 mA |
| Calibration | Single gas calibration |
| Dimensions | 5.25"x 3.25"x 1.4" inches |
| Optional relay contact rating | 2 Amps @ 24 V |

DCS CO2 Family



Model 307 HVAC Wallmount Applications



Model 300 OEM/HVAC Applications



Model 320 Ductmount Applications



Digital Control Systems, Inc.
7401 SW Capitol Highway Portland, OR 97219
USA
Phone: (503)246-8110
Toll Free: (877)468-8337
Fax: (503)246-8747

Visit us online at: www.dcs-inc.net

DIVISION 48 **ELECTRICAL POWER
GENERATION**

KACO 2.5KW GRID-TIED INVERTER

[RELATED SECTION 48 19 16]

Model Number: blueplanet 2502xi

Location: Outdoor Kitchen Mechanical Closet

Dimensions:

Length: 32" [813 mm]

Width: 14" [356 mm]

Depth: 8-1/4" [208 mm]

Weight: 52 lbs [24 kg]

Features:

High efficiency: 95.5% CEC efficiency on all 02xi series inverters ensures low energy losses

Wide MPPT range: Highest string sizing flexibility with all modules and temperature ranges

Low start-up voltage: KACO inverters wake up earlier and work longer than the competition

Lockable DC/AC disconnect: Pre-wired & separable integrated disconnects

Multiple knock-outs: Knock-outs on bottom, sides and back offer great installation flexibility

Electrical:

Wattage: 2500 W

Voltage: 550 V

Approval Certificates:

UL Listed

UL 1741 compliant

IEEE 1547 compliant

CSA 22.2 C US compliant

Available: Schuco USA



- Thin-Film →
- Solar Thermal Systems →
- Photovoltaic Systems →

Solar Heat & Solar Power | Products | Photovoltaic Systems | Inverter | Kaco Inverter
blueplanet 1502xi / 2502xi / 3502xi / 5002xi

Kaco Inverter blueplanet 1502xi / 2502xi / 3502xi / 5002xi

KACO blueplanet 2502xi inverter



KACO blueplanet 02xi grid-tied inverter series

KACO blueplanet 02xi grid-tied inverter series

The KACO blueplanet 02xi gridtied inverter series, which was engineered using cutting-edge technology, has the highest energy efficiency in its class at over 95.5 %. Incorporating convection-cooled aluminium housing, the inverter is highly reliable. The internal electronic design has been simplified and made more reliable using the latest generation of Digital Control technology. The inverter features a programmable LCD display with a night switch and a play web monitoring option. The units come pre-assembled to a connection box including an NEC compliant AC/DC disconnect switch. A grid voltage of 240 or 208 VAC can be selected depending on the field.

| Schüco Inverter table | | | | |
|---|--|--|--|--|
| Product name | KACO blueplanet 1502xi | KACO blueplanet 2502xi | KACO blueplanet 3502xi | KACO blueplanet 5002xi |
| Schüco article number | U-600230 | U-600231 | U-600252 | U-600253 |
| Input Data | | | | |
| Max. recommended array input power (DC @ STC) | 2000 W | 3000 W | 4000 W | 6000 W |
| Max. DC Voltage | 550 V | 550 V | 550 V / 600 V* | 550 V / 600 V* |
| MPP Voltage Range | 125 – 400 V | 200 – 450 V | 200 – 510 V | 200 – 510 V |
| Max. DC input current | 14.3 A | 13.5 A | 18.5 A | 26.5 A |
| Number of Fused String Inputs | 3 | 3 | 3 | 3 |
| DC Start Voltage | 125 V | 250 V | 250 V | 250 V |
| Output Data (AC) | | | | |
| AC maximum output power | 1500 W | 2500 W | 3500 W | 5000 W |
| AC maximum output current | 8 A | 12 / 12.5 A | 16 / 17 V | 24 A |
| AC nominal voltage / range | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V |
| AC frequency / range | 60 Hz (59.3 Hz – 60.5 Hz) | 60 Hz (59.3 Hz – 60.5 Hz) | 60 Hz (59.3 Hz – 60.5 Hz) | 60 Hz (59.3 Hz – 60.5 Hz) |
| Power factor (nominal) | > 0.99 | > 0.99 | > 0.99 | > 0.99 |
| Efficiency | | | | |
| Peak (inverter) efficiency | 95.5 % @ 208 V, 95.9 % @ 240 V | 95.6 % @ 208 V, 96.0 % @ 240 V | 95.9 % @ 208 V, 96.2 % @ 240 V | 96.0 % @ 208 V, 96.3 % @ 240 V |
| CEC weighted efficiency | 95.0 % @ 208 V, 95.5 % @ 240 V | 95.0 % @ 208 V, 95.5 % @ 240 V | 95.5 % @ 208 V, 95.5 % @ 240 V | 95.0 % @ 208 V, 95.5 % @ 240 V |



1502xi
2502xi
3502xi
5002xi

KACO blueplanet 02xi series grid-tied inverters

Performance

| | |
|------------------------|---|
| High efficiency: | 95.5% CEC efficiency on all 02xi series inverters ensures low energy losses |
| Wide MPPT range: | Highest string sizing flexibility with all modules and temperature ranges |
| Low start-up voltage: | KACO inverters wake up earlier and work longer than the competition |
| Designed for max. ROI: | Newest generation IGBTs and advanced MPPT algorithms |

Ease of installation

| | |
|--------------------------------|---|
| easy install T-bracket: | Minimizes mounting process to approximately 15 minutes |
| Lockable DC/AC disconnect: | Save up to \$150 with the pre-wired & separable integrated disconnects |
| Multiple knock-outs: | Knock-outs on bottom, sides and back offer great installation flexibility |
| Connection box: | Avoid costly channel raceways by directly connecting multiple inverters |
| Reduced weight: | KACO inverters are up to 50% lighter than comparably sized inverters |
| Reduced side clearance: | No fan cooling outlets on the sides |
| Field selectable voltages: | Use the same inverter in 208V, 220V or 240V grid settings |

Reliability

| | |
|---------------------------------|--|
| History: | KACO has been manufacturing power electronics for more than 60 years |
| Experience: | More than 2.5GW of inverters worth about \$1 billion installed worldwide |
| Split architecture design: | Power electronics are protected in a separate chamber |
| Sealed outdoor enclosure: | Protects power electronics from insects, dust, humidity and ocean air |
| DC reverse polarity protection: | Avoids potential damage to inverter caused by mis-wiring during installation |
| Redundant power capacitors: | Increases the lifetime of your inverter |
| Convection cooling: | No moving parts increases the uptime of your PV system |

Monitoring

KACO proLOG: Monitor up to 32 inverters as well as multiple sensors

KACO watchDOG: Integrated monitoring card decreases costs and increases reliability to give you the most innovative monitoring solution

easyLink data interface: Integrated RS485 comm card saves over \$200 compared to some competitors

Integrated inverter display: Easy to use push-button interface to configure the inverter and access stored PV system data on the LCD screen

Integrated night switch: Activates inverter display even after the PV system has shut down

blueplanet web: Free monitoring option for residential systems up to 10 kW

Warranty

KACO easySwap policy: No hassle inverter exchange policy is linked to serial number not original owner. No paperwork necessary.

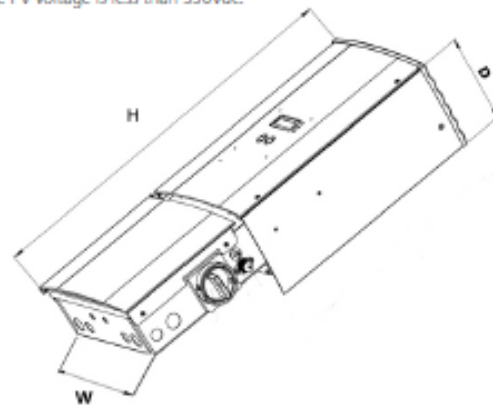
Reimbursement policy: KACO's \$150 warranty service reimbursement is among the best in the industry

KACO guarantee: 02xi series inverter repairs after warranty will never be more than \$500

10 years standard warranty: Warranties are only as valuable as the strength and longevity of the manufacturer. KACO is one of the few established inverter companies older than the warranties they offer.

| Model number | blueplanet 1502xi | blueplanet 2502xi | blueplanet 3502xi | blueplanet 5002xi |
|------------------------------------|---|---------------------------|--------------------------------|---------------------------|
| Input data (DC) | | | | |
| DC operating range (MPP) | 125 – 400 V _{dc} | 200 – 450 V _{dc} | 200 – 510 V _{dc} | 200 – 510 V _{dc} |
| Max. DC Input voltage | 550 V _{dc} | 550 V _{dc} | 600* V _{dc} | 600* V _{dc} |
| Nominal DC Input current | 14.3 A _{dc} | 13.5 A _{dc} | 18.5 A _{dc} | 26.5 A _{dc} |
| Max. DC Input Isc current | 21.45 A _{dc} | 21.45 A _{dc} | 28 A _{dc} | 40 A _{dc} |
| Output data (AC) | | | | |
| Max. continuous output power (CEC) | 1500 W | 2500 W | 3500 W | 5000 W |
| Max. over-current protection | 15 A | 20 A | 25 A | 30 A |
| Max. continuous current | 240 V | 8 A _{ac} | 12 A _{ac} | 16 A _{ac} |
| | 208 V | 8 A _{ac} | 12.5 A _{ac} | 17 A _{ac} |
| AC operating range | 240 V | 211 – 264 V | | |
| | 208 V | 184 – 226 V | | |
| | 220 V | 198 – 242 V (for Mexico) | | |
| Frequency | 60 Hz (59.3 – 60.5 Hz) | | | |
| CEC rated efficiency | 240 V | 95.5% | 95.5% | 95.5% |
| | 208 V | 95% | 95% | 95% |
| Additional data | | | | |
| AC/DC disconnect ratings | AC: 300 V – 36 A / DC: 600 V – 40 A | | | |
| Cooling | True convection - ultimate reliability (5002xi - fan assisted) | | | |
| DC reverse polarity protection | Yes | | | |
| Ground fault protection | Integrated ground fault detector/interrupter (GFDI) | | | |
| Grounding | Field selectable positive or negative ground option | | | |
| Visual displays | Backlit LCD w/ convenient night switch & push button controls | | | |
| Included accessory interfaces | easyLink RS485 & S0 port | | | |
| Ambient temp @ max AC power | -4°F – +104°F (-20°C – +40°C) | | -13°F – +104°F (-25°C – +40°C) | |
| Ambient operating temp | -4°F – +140°F (-20°C – +60°C) | | -13°F – +140°F (-25°C – +60°C) | |
| Thermal protection | Yes | | | |
| Noise emissions | < 35 dB (silent operation) / 5002xi < 45 dB (near silent operation) | | | |
| Night power consumption | 0.3 W | | | |
| Warranty | Standard easySwap 10 years | | | |
| Certifications | | | | |
| Safety compliance | UL 1741, IEEE 1547, NEC, CSA 22.2 No.107.1-01 | | | |
| Communications compliance | FCC Part 15 Class B | | | |

* - Unit will only feed power if the PV voltage is less than 550Vdc.



Mechanical Specifications

| Model | Height (H) | Width (W) | Depth (D) | Weight |
|-----------|---------------------|-----------------|--------------------|----------------|
| 1502xi | 30 in. (761 mm) | 14 in. (356 mm) | 8 1/4 in. (208 mm) | 42 lbs (19 kg) |
| 2502xi | 32 in. (813 mm) | 14 in. (356 mm) | 8 1/4 in. (208 mm) | 52 lbs (24 kg) |
| 3502xi | 35 7/8 in. (914 mm) | 14 in. (356 mm) | 9 1/4 in. (241 mm) | 69 lbs (31 kg) |
| 5002xi | 35 7/8 in. (914 mm) | 14 in. (356 mm) | 9 1/4 in. (241 mm) | 70 lbs (32 kg) |
| Enclosure | NEMA 3R | | | |

KACO 5KW GRID-TIED INVERTER

[RELATED SECTION 48 19 16]

Model Number: blueplanet 5002xi

Location: OM Closet 1, OM Closet 3, Outdoor Kitchen Mechanical Closet

Dimensions:

Length: 35-7/8" [914 mm]

Width: 14" [356 mm]

Depth: 9-1/4" [241 mm]

Weight: 70 lbs [32 kg]

Features:

High efficiency: 95.5% CEC efficiency on all 02xi series inverters ensures low energy losses

Wide MPPT range: Highest string sizing flexibility with all modules and temperature ranges

Low start-up voltage: KACO inverters wake up earlier and work longer than the competition

Lockable DC/AC disconnect: Pre-wired & separable integrated disconnects

Multiple knock-outs: Knock-outs on bottom, sides and back offer great installation flexibility

Electrical:

Wattage: 5000 W

Voltage: 600 V

Approval Certificates:

UL Listed

UL 1741 compliant

IEEE 1547 compliant

CSA 22.2 C US compliant

Available: Schuco USA



Thin-Film →

Solar Thermal Systems →

Photovoltaic Systems →

Solar Heat & Solar Power | Products | Photovoltaic Systems | Inverter | Kaco Inverter
blueplanet 1502xi / 2502xi / 3502xi / 5002xi

Kaco Inverter blueplanet 1502xi / 2502xi / 3502xi / 5002xi

KACO blueplanet 2502xi inverter



KACO blueplanet 02xi grid-tied inverter series

KACO blueplanet 02xi grid-tied inverter series

The KACO blueplanet 02xi grid-tied inverter series, which was engineered using cutting-edge technology, has the highest energy efficiency in its class at over 95.5 %. Incorporating convection-cooled aluminium housing, the inverter is highly reliable. The internal electronic design has been simplified and made more reliable using the latest generation of Digital Control technology. The inverter features a programmable LCD display with a night switch and a play web monitoring option. The units come pre-assembled to a connection box including an NEC compliant AC/DC disconnect switch. A grid voltage of 240 or 208 VAC can be selected depending on the field.

Schüco Inverter table

| Product name | KACO blueplanet 1502xi | KACO blueplanet 2502xi | KACO blueplanet 3502xi | KACO blueplanet 5002xi |
|---|---|---|---|---|
| Schüco article number | U-600230 | U-600231 | U-600252 | U-600253 |
| Input Data | | | | |
| Max. recommended array input power (DC @ STC) | 2000 W | 3000 W | 4000 W | 6000 W |
| Max. DC Voltage | 550 V | 550 V | 550 V / 600 V* | 550 V / 600 V* |
| MPP Voltage Range | 125 – 400 V | 200 – 450 V | 200 – 510 V | 200 - 510 V |
| Max. DC input current | 14.3 A | 13.5 A | 18.5 A | 26.5 A |
| Number of Fused String Inputs | 3 | 3 | 3 | 3 |
| DC Start Voltage | 125 V | 250 V | 250 V | 250 V |
| Output Data (AC) | | | | |
| AC maximum output power | 1500 W | 2500 W | 3500 W | 5000 W |
| AC maximum output current | 8 A | 12 / 12.5 A | 16 / 17 V | 24 A |
| AC nominal voltage / range | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V | 184 – 226 V @ 208 V, 211 – 264 V @ 240 V |
| AC frequency / range | 60 Hz (59.3 Hz – 60.5 Hz) | 60 Hz (59.3 Hz – 60.5 Hz) | 60 Hz (59.3 Hz – 60.5 Hz) | 60 Hz (59.3 Hz – 60.5 Hz) |
| Power factor (nominal) | > 0.99 | > 0.99 | > 0.99 | > 0.99 |
| Efficiency | | | | |
| Peak (inverter) efficiency | 95.5 % @ 208 V, 95.9 % @ 240 V | 95.6 % @ 208 V, 96.0 % @ 240 V | 95.9 % @ 208 V, 96.2 % @ 240 V | 96.0 % @ 208 V, 96.3 % @ 240 V |
| CEC weighted efficiency | 95.0 % @ 208 V, 95.5 % @ 240 V | 95.0 % @ 208 V, 95.5 % @ 240 V | 95.5 % @ 208 V, 95.5 % @ 240 V | 95.0 % @ 208 V, 95.5 % @ 240 V |



1502xi
2502xi
3502xi
5002xi

KACO blueplanet 02xi series grid-tied inverters

Performance

| | |
|------------------------|---|
| High efficiency: | 95.5% CEC efficiency on all 02xi series inverters ensures low energy losses |
| Wide MPPT range: | Highest string sizing flexibility with all modules and temperature ranges |
| Low start-up voltage: | KACO inverters wake up earlier and work longer than the competition |
| Designed for max. ROI: | Newest generation IGBTs and advanced MPPT algorithms |

Ease of installation

| | |
|--------------------------------|---|
| easy install T-bracket: | Minimizes mounting process to approximately 15 minutes |
| Lockable DC/AC disconnect: | Save up to \$150 with the pre-wired & separable integrated disconnects |
| Multiple knock-outs: | Knock-outs on bottom, sides and back offer great installation flexibility |
| Connection box: | Avoid costly channel raceways by directly connecting multiple inverters |
| Reduced weight: | KACO inverters are up to 50% lighter than comparably sized inverters |
| Reduced side clearance: | No fan cooling outlets on the sides |
| Field selectable voltages: | Use the same inverter in 208V, 220V or 240V grid settings |

Reliability

| | |
|---------------------------------|--|
| History: | KACO has been manufacturing power electronics for more than 60 years |
| Experience: | More than 2.5GW of inverters worth about \$1 billion installed worldwide |
| Split architecture design: | Power electronics are protected in a separate chamber |
| Sealed outdoor enclosure: | Protects power electronics from insects, dust, humidity and ocean air |
| DC reverse polarity protection: | Avoids potential damage to inverter caused by mis-wiring during installation |
| Redundant power capacitors: | Increases the lifetime of your inverter |
| Convection cooling: | No moving parts increases the uptime of your PV system |

Monitoring

KACO proLOG: Monitor up to 32 inverters as well as multiple sensors

KACO watchDOG: Integrated monitoring card decreases costs and increases reliability to give you the most innovative monitoring solution

easyLink data interface: Integrated RS485 comm card saves over \$200 compared to some competitors

Integrated inverter display: Easy to use push-button interface to configure the inverter and access stored PV system data on the LCD screen

Integrated night switch: Activates inverter display even after the PV system has shut down

blueplanet web: Free monitoring option for residential systems up to 10 kW

Warranty

KACO easySwap policy: No hassle inverter exchange policy is linked to serial number not original owner. No paperwork necessary.

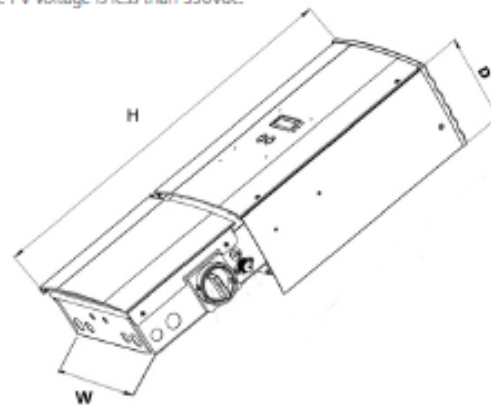
Reimbursement policy: KACO's \$150 warranty service reimbursement is among the best in the industry

KACO guarantee: 02xi series inverter repairs after warranty will never be more than \$500

10 years standard warranty: Warranties are only as valuable as the strength and longevity of the manufacturer. KACO is one of the few established inverter companies older than the warranties they offer.

| Model number | blueplanet 1502xi | blueplanet 2502xi | blueplanet 3502xi | blueplanet 5002xi |
|------------------------------------|---|---------------------------|---------------------------------|---------------------------|
| Input data (DC) | | | | |
| DC operating range (MPP) | 125 – 400 V _{dc} | 200 – 450 V _{dc} | 200 – 510 V _{dc} | 200 – 510 V _{dc} |
| Max. DC Input voltage | 550 V _{dc} | 550 V _{dc} | 600* V _{dc} | 600* V _{dc} |
| Nominal DC Input current | 14.3 A _{dc} | 13.5 A _{dc} | 18.5 A _{dc} | 26.5 A _{dc} |
| Max. DC Input Isc current | 21.45 A _{dc} | 21.45 A _{dc} | 28 A _{dc} | 40 A _{dc} |
| Output data (AC) | | | | |
| Max. continuous output power (CEC) | 1500 W | 2500 W | 3500 W | 5000 W |
| Max. over-current protection | 15 A | 20 A | 25 A | 30 A |
| Max. continuous current | 240 V | 8 A _{ac} | 12 A _{ac} | 16 A _{ac} |
| | 208 V | 8 A _{ac} | 12.5 A _{ac} | 17 A _{ac} |
| AC operating range | 240 V | 211 – 264 V | | |
| | 208 V | 184 – 226 V | | |
| | 220 V | 198 – 242 V (for Mexico) | | |
| Frequency | 60 Hz (59.3 – 60.5 Hz) | | | |
| CEC rated efficiency | 240 V | 95.5% | 95.5% | 95.5% |
| | 208 V | 95% | 95% | 95% |
| Additional data | | | | |
| AC/DC disconnect ratings | AC: 300 V – 36 A / DC: 600 V – 40 A | | | |
| Cooling | True convection - ultimate reliability (5002xi - fan assisted) | | | |
| DC reverse polarity protection | Yes | | | |
| Ground fault protection | Integrated ground fault detector/interrupter (GFDI) | | | |
| Grounding | Field selectable positive or negative ground option | | | |
| Visual displays | Backlit LCD w/ convenient night switch & push button controls | | | |
| Included accessory interfaces | easyLink RS485 & 50 port | | | |
| Ambient temp @ max AC power | -4°F – +104°F (-20°C – + 40°C) | | -13°F – +104°F (-25°C – + 40°C) | |
| Ambient operating temp | -4°F – +140°F (-20°C – + 60°C) | | -13°F – +140°F (-25°C – + 60°C) | |
| Thermal protection | Yes | | | |
| Noise emissions | < 35 dB (silent operation) / 5002xi < 45 dB (near silent operation) | | | |
| Night power consumption | 0.3 W | | | |
| Warranty | Standard easySwap 10 years | | | |
| Certifications | | | | |
| Safety compliance | UL 1741, IEEE 1547, NEC, CSA 22.2 No.107.1-01 | | | |
| Communications compliance | FCC Part 15 Class B | | | |

* - Unit will only feed power if the PV voltage is less than 550Vdc.



| Mechanical Specifications | | | | |
|---------------------------|---------------------|-----------------|--------------------|----------------|
| Model | Height (H) | Width (W) | Depth (D) | Weight |
| 1502xi | 30 in. (761 mm) | 14 in. (356 mm) | 8 1/4 in. (208 mm) | 42 lbs (19 kg) |
| 2502xi | 32 in. (813 mm) | 14 in. (356 mm) | 8 1/4 in. (208 mm) | 52 lbs (24 kg) |
| 3502xi | 35 7/8 in. (914 mm) | 14 in. (356 mm) | 9 1/4 in. (241 mm) | 69 lbs (31 kg) |
| 5002xi | 35 7/8 in. (914 mm) | 14 in. (356 mm) | 9 1/4 in. (241 mm) | 70 lbs (32 kg) |
| Enclosure | NEMA 3R | | | |