

## DAYLIGHTING QUALITY

### 1) NATURAL LIGHTING

The main criteria for interior design is leading the user from darkness toward daylight. For this reason, the main source of daylighting is the south wall. Moreover, a whole part of the house may be unfolded, letting an internal open courtyard provide a touch of natural environment into the house.

Small fixed windows with steel sash and frames are also strategically located to allow the user to get a beam of the morning or sunset light –even though such orientations are inconvenient from a bioclimatic point of view-, as well as to see the outside while working or having lunch. In most cases, glass is covered with shutters and stainless steel frames fitting woven wire cloth on the outside, as are the lateral surfaces within the roof framing. These provide diffuse lighting in the east-west direction.



The south wall can be divided into three parts, as follows:

- Two solar greenhouses, which are externally covered by glass panes with no vertical sash and can be fully opened.
- The photovoltaic wall, which external side is a double glazing 12mm.-thick where the PV cells are encapsulated. The configuration of PV cells within the transparent glazing produces a special effect when sunlight gets inside the lounge (movable module).



### 2) WINDOWS

#### 2.1) SOUTH SIDE

##### 2.1.a) SOLAR GREENHOUSES

The solar greenhouses are on the way of users when they open the panes to extend the inside space to the decks. The main function of both south-facing glazing is to take advantage of sun radiation and heating

passively, for both lighting and heating the indoor space and for giving heat to the gels located under the ceramic flooring.

The interior enclosure is made up of 3 panes of glass with thermal properties. The exterior enclosure is made up of 4 sliding panes of bio-clean glass. Light metal blinds hang on the inside of the greenhouses so as to manually control solar penetration if desired.

### 2.1.b) BATHROOM

The bathroom skylight brings in diffuse light, filtered through the evacuated tube solar collectors on the roof. Its three windows can be opened to provide ventilation. The sloped ceiling and its “hanging” skylight makes the central area of the bathroom a spatial highlight.

### 3) EAST AND WEST SIDES

Each lateral surface within the framing in the kitchen and the bedroom is covered with two translucent polycarbonate layers with a layer of see-through cellulose in between them. Together with the woven wire cloth on the outside, these materials provide insulation, allow some daylighting into the house and neutralize the sun radiation in the most inconvenient positions (east and west).

### 4) NORTH SIDE

The kitchen window has two panes. One of them can be slid into the wall to let the person cooking have a view from the outside and pass plates out to the porch. The kitchen and bedroom glass doors, located in the north-facing wall, provide diffuse light for this part of the house.

### 5) SMALL WINDOWS

Shutters covered with woven wire cloth can be opened from the outside to make cleaning easier. Operable windows, i.e. the kitchen and the bathroom windows, have no shutters.

All panes of fixed glazing and the kitchen window are made of glass with thermal properties. This provides the glass with solar control properties and low emissivity, and can reduce the energy losses produced in a single glazing up to 70%.

