

Passive Sun Control - the basics.

Though 'Solar Pergola' has been used for ages as a generic term, a company has been able to register it as a trademark. The result is that the name can only be used to describe their product. To prevent contravention of the trademark this leaflet therefore describes Passive Sun Control. Do not confuse this with adjustable louvres or opening roofs, which in fact constitute Active Sun Control. The included sun path details relate to Perth (32°s).

Passive sun control relies totally on correct orientation of the fixed shade elements (louvres). These have to be arranged to maximise shade in summer and minimise shade in winter. The sun does all the moving to facilitate this! Each shade element must have a large aspect ratio (width to thickness) to provide maximum shade from the broad surface and minimum shade from the edge. An aspect ratio of 8 to 1 should be considered the minimum. They must be attached at the correct angle for maximum winter sun penetration, with the correct overlap for maximum summer shade, but can be varied (slightly) to accommodate a personal requirement.

They can be made from many different materials, however each has its own properties which determine suitability:

Timber has limitations with span and angle, to limit warping (despite its widespread aesthetic appeal).

Fibre-board has similar problems to timber, but is less susceptible to warping (after good surface protection).

(neither of the above materials provide rain reduction as standard)

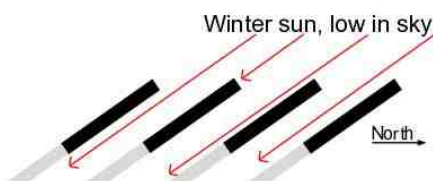
Plastics are prone to buckle from heat, limiting their span.

Steel/aluminium are best, as they require stiffening (with bends), enabling both low angles and long spans. Surface protection is generally long lasting, and rain reduction is normally incorporated during the forming process.

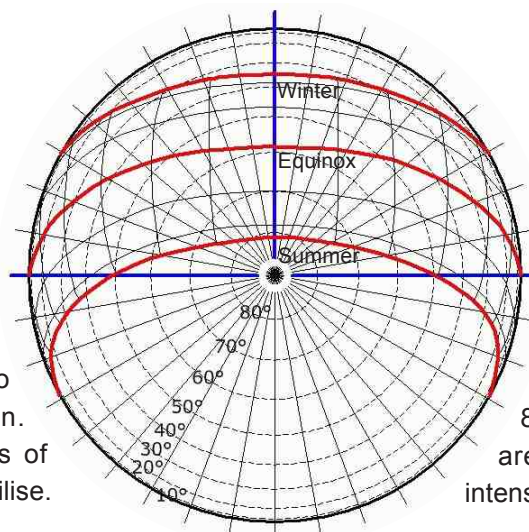
WINTER

Sun intensity about
0.9 kW /m²

At the winter solstice the sun rises and sets almost 30 degrees North of due East/West, and only rises to 35 degrees above the horizon. There are only 10 daylight hours of lower intensity sunshine to try to utilise.



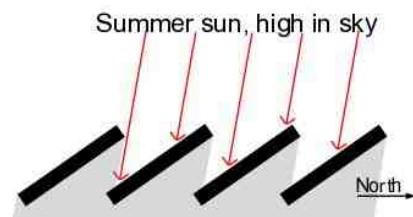
Sunshine that penetrates the Passive Sun Control will both light and heat all (preferably internal) surfaces. The sun is 'in front of' the shade elements (allowing sunlight through) for the whole day.



SUMMER

Sun intensity about
1.2 kW /m²

At the summer solstice the sun rises and sets almost 30 degrees South of due East/West, and rises to 81 degrees above the horizon. There are up to 14 daylight hours of highly intense sunshine to contend with.



By blocking direct sunshine the building is only effected by the ambient outside air temperature. The sun starts and ends the day 'behind' the shade elements providing (mostly) total shade.

The shade slowly varies between the two extremes, throughout the year. Toward the Equinoxes the shade becomes more evenly distributed throughout the day (about 50% at midday).

As the structure is 'permanently open' it promotes easy air flow, and is generally allowed right up to block boundaries. Adding clear or tinted sheeting for total rain protection adds a 'wind loading', requiring a heavier support structure, and is not generally permitted close to block boundaries.

For more information call: Steve 0410 946 356