Guide To Ideal Altair® Louvre Windows in Climate Zones 4 & 5

Breezway Technical Bulletin

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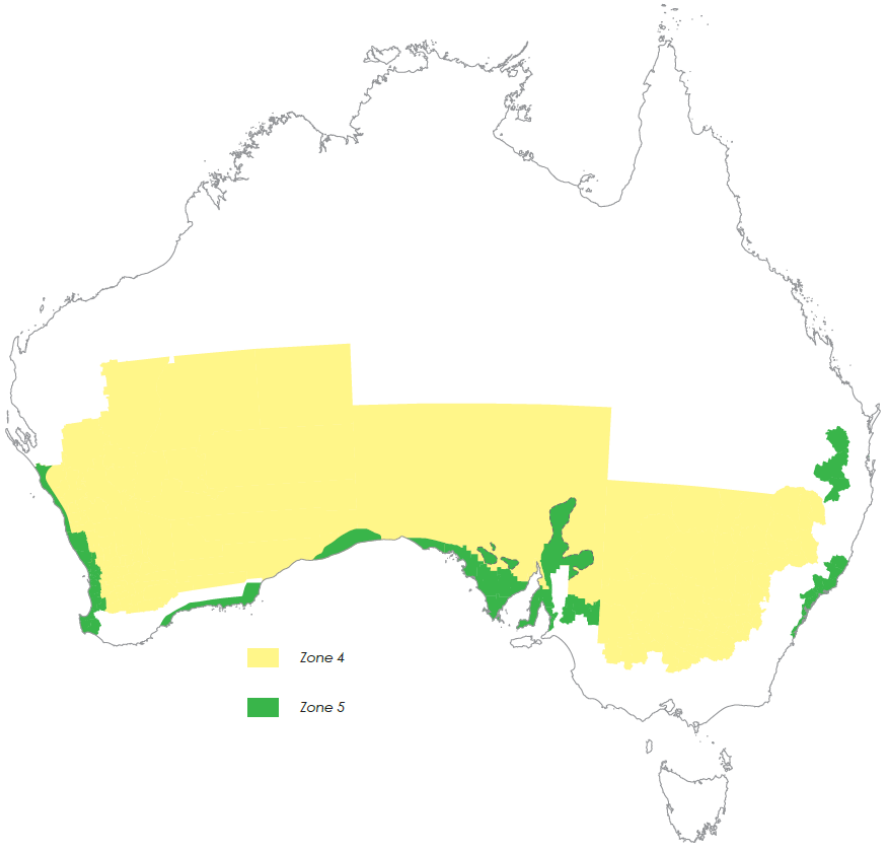
This guide gives suggestions on good Altair Louvre Window design principles to achieve a comfortable indoor climate, save energy used for heating and cooling and meet the energy efficiency requirements of the National Construction Code.

Climate Zones 4 & 5

Climate zones 4 and 5 have hot summers and cool winters. An average house in climate zones 4 or 5 will use approximately equal amounts of energy for space cooling and for space heating.
Major cities include: Sydney, Port Macquarie, Tamworth, Adelaide & Perth



Main Objectives of Windows in Climate Zones 4 & 5

1. Maximise cooling natural ventilation.
2. Reduce solar heat gain on East, West and South orientations. Increase beneficial solar heat gain on Northern orientation.
3. Reduce conducted heat gain and loss.

1. Maximise cooling natural ventilation.

One of the key functions of a window is to allow fresh air into a building. If stale indoor air is not flushed out of a building by fresh outdoor air, indoor air can be of such poor quality that the health and productivity of the building occupants can be negatively affected. The National Construction Code (NCC) recognises this and legislates that all habitable rooms must have minimum sized ventilation openings to ensure adequate indoor air quality.

Opening windows to allow fresh air into a building not only improves indoor air quality, it also improves the comfort of the building occupants as warmed indoor air is allowed to escape the building, to be replaced by cooler outdoor air. The larger the ventilation openings, the greater the cooling effect. The NCC also recognises this and goes on to clarify that the ventilation opening of a window is the openable size of the window, not the overall window size. As different types of windows have different opening areas the choice of window type will have a dramatic effect on the levels of cooling ventilation achieved and the ease with which the requirements of the NCC will be met.

Window Type	Total Overall Size of Windows	Ventilation Opening %	Total Openable Size of Windows	Total Ventilation Opening As a % of Floor Area – 30m^2 Room
Fixed Window	10.0m^2	0%	0.0m^2	0%
Chain-wound awning window	10.0m^2	15%	1.5m^2	5%
Double-hung or sliding window	10.0m^2	40%	4.0m^2	13%
Altair Louvre Window	10.0m^2	90%	9.0m^2	30%

Simply replacing sliding or double-hung windows with Altair Louvre Windows can more than double the total ventilation opening area, and replacing awning windows with Altair Louvre Windows can increase the total ventilation opening area by 600%. These are masive increases in the amount of healthy cooling ventilation within a building and will drastically increase the comfort and indoor air quality enjoyed by the building's occupants.

For those times when the windows will be closed and conditioning systems run it is reassuring to know that Altair Louvre Windows seal up tightly to far exceed the air infiltration requirements of AS2047 "Windows in Buildings".

2. Reduce solar heat gain on East, West and South orientations. Increase solar heat gain on Northern orientation.

The objective in mixed climates is to balance the amount of beneficial solar heat gain through the windows with the amount of detrimental solar heat gain. This can be achieved through tuning the SHGC and shading of the windows for each orientation.

Windows with a Northern orientation should have clear glazing to allow high Solar Heat Gain Coefficients (SHGC) and shading should be designed to allow solar exposure in winter so that beneficial solar gains can offset conducted heat losses. Additional solar exposure from adding or enlarging windows with a Northern orientation can improve a home's energy rating or allow additional or larger windows on other orientations in some cases.

External shading gives a greater benefit than toned or coated glazing and should be considered on all orientations. Clause 3.12.2.2 and figure 3.12.2.2 in the National Construction Code (Vol Two) gives details on the requirements for shading. Shading can be improved by:

- Increasing the projection of the shading object (eg verandah, balcony, fixed canopy, eaves etc) with no change to the window height (eg wider eaves or adding verandas or outdoor living areas);
- Decreasing distance between top of window and the shading object with no change to the window height or the projection of the shading device (eg awnings instead of eaves);
- Decreasing the window height while increasing the window width to maintain the window size with no changes to the shading object.
- Using a shading device (eg shutter, blind, screen) that restricts at least 80% of summer solar radiation.
- Shading on the Northern orientation should be carefully designed to block direct sun during summer and allow direct sun to fall onto window during winter. Adjustable shading can also be used to block direct sun during summer and allow direct sun during winter.

Although not recognised by the National Construction Code, insect screens will also help to reduce solar radiation and will give a beneficial effect on the Eastern, Western and Southern orientation. The shading benefit of screens is more pronounced on Altair Louvre Windows than on most other window types as the screens cover the entire louvre window area, whereas fixed panes on other window types are not screened.

Altair Louvre Windows with timber or aluminium blades block almost all solar radiation and achieve the lowest possible Solar Heat Gain Coefficients of any Australian Window Systems*. Altair Louvre Windows with timber or aluminium blades also offer the benefit of being able to completely block solar heat gain while still being opened to allow cooling natural ventilation.

Modelling by the Sustainable Window Alliance shows that changing from clear glazing to toned glazing has the potential to improve a home's energy rating by up to approximately 0.5 stars. It is expected that good external shading and using timber or aluminium blades would result in improvements greater than 1 star.

3. Reduce conducted heat gain

The rate of non-solar heat loss or gain through a window is measured by the U-value. U-values are measures of the entire window assembly and include the framing materials, seals and glass.

Lower U-values will reduce heat losses or gains through conductance and will help to improve the energy efficiency of a home. Lower U-values can be achieved through glazing with low e coatings, timber louvre blades, or choosing a lighter weight aluminium frame or timber frame.

It is worth noting that when windows are opened to allow cooling through ventilation, the U-values become irrelevant in that heat loss through the windows is then desirable.

Modelling by the Sustainable Window Alliance shows that each unit reduction in U-value has the potential to improve a home's star rating by up to approximately 0.33 stars.

WERS Ratings of Window Systems Using Breezway Altair Louvres

WERS ratings are available for the following window systems that use Altair Louvres

Manufacturer	Window	WERS ID	Min U-value	Max U-value	Min SHGC	Max SHGC
Breezway	52mm Aluminium Louvre Window System	BRZ-003-XX	4.1	6.0	0.31	0.72
Breezway	Easyscreen Aluminium Louvre Window System	BRZ-006-XX	4.4	6.2	0.08*	0.64
Breezway	Altair Components in Timber Frame	BRZ-005-XX	3.8	5.6	0.3	0.69
G James	050 Series – 48mm aluminium frame with Altair Gallery	GJA-050-XX GJA-052-XX	4.3	6.0	0.29	0.65
G James	050 Series – 101mm aluminium frame with Altair Gallery	GJA-053-XX GJA-055-XX	4.5	6.1	0.28	0.62
Vantage	Series 525 Louvre Window	VAN-004-XX	4.6	6.2	0.3	0.64
Vantage	Series 525 Louvre Window into Series 400 Centreglazed	AWS-058-XX	4.8	6.2	0.26	0.55

*A SHGC of 0.08 is achieved using timber or aluminium blades. While this SHGC is not an official WERS rating, it was generated by Peter Lyons (one of the designers of WERS) using the official WERS rating methodology and software.