

Australian windows and doors are in for big changes

The Australian Glazing industry reports **“From an energy viewpoint, Australian windows are the worst in the developed world...the energy performance of today’s windows is little better than it was 100 years ago... the use of energy efficient products is severely hamstrung in that builders particularly want nothing more than the lowest price, irrespective of performance.”** (1)

The substantial majority of Australian windows and doors marketed today are manufactured from aluminium frames with single pane glass. Both the aluminium frames and the single pane glass have very poor thermal performance. The **Australian Glazing Association** further reports **“Of the heat entering a building, 85% does so through the windows. Of heat lost from a building 55% is lost through windows. As a consequence, households and buildings throughout the country are using 60% more energy to heat and cool than is necessary”.** (1) Australia consumes and wastes substantial amounts of electricity to keep Australian homes cool in the summer and warm in the winter. Such power consumption generates substantial and unnecessary levels of greenhouse gas emissions. Every single home in Australia is estimated to create on average one tonne of unnecessary greenhouse gas emissions every year as a result of this heating and cooling.

Australian greenhouse gas emissions have over the last 30 years increased

by 50%. The Australian Government has recognised this and is currently bringing in legislation, through revisions to the Building Code, making it mandatory that all Australian homes to meet a minimum level of thermal performance.

The Australian window and door manufacturing industry has reacted positively to the Governments news by focusing on developing windows and doors that are thermally efficient and will meet the new codes.

Timber windows and doors

Timber window and door frames themselves have always rated very high in thermal performance. However, most timber windows and doors manufactured in Australia today incorporate only single pane glass, which is generally 4 to 6mm thick and which has very poor thermal performance. And the glazing rebates in the timber window and door profiles manufactured today are very shallow and suit only single pane glass. The timber window and door industry is currently redesigning their timber window and door profiles to be both significantly wider and deeper to provide for double glazing, which is generally 18 to 24mm thick. Critically important to such timber window designs is that their timber profiles meet the specifications to suit double glazing set out by the **Australian Insulated Glass Manufacturers Association (IGMA)** and the “normative and informative” sections of the current Australian Standard AS 4666:2000. **The Window and Door Industry Council (WADIC)**,

which represents Australian timber window and door manufacturers, is doing a lot of constructive work on behalf of its members to ensure that new timber window and door profiles designs perfectly suit double glazing and all timber windows and doors meet the new minimum level of thermal performance.

Aluminium windows and doors

The aluminium window and door industry is advancing their products in the following ways:

- Most Australian aluminium window profile suppliers have been designing new aluminium window and door systems with new profiles to accept double glazing. These aluminium window and door systems will have double glazing with high thermal performance - but the aluminium frames themselves remain very poor in thermal performance.
- “High tech” thermally improved aluminium window and door profiles are being imported from Europe in increasing volumes with plastic bars in the “middle” of each aluminium profile and these windows and doors are being machined and assembled here in Australia. These “high tech” thermally broken window and door frames achieve high thermal performance.
- Australasian based **‘Vantage Aluminium Windows’** leads the aluminium window industry with a new “high tech” aluminium window and door system named **“Thermal Heart”**, which also has plastic bars in the middle of each of their aluminium profiles. These ‘thermally

broken’ window and door profiles, like the imported European ones, achieve high thermal performance. Vantage’s ‘Thermal Heart’ windows and doors are available throughout Australia from their nationwide network.

- Aluminium window and door system and profile suppliers have developed their profiles to make up timber inside and aluminium outside windows and doors. These ‘composite’ windows and doors achieve high thermal performance and also include the natural beauty of real and solid timber on the inside.

PVC windows and doors

PVC window and door profiles are being imported into Australia mainly from Europe, America and China. The thermal performance of the standard PVC window and door profiles performs very highly because of the following features:

- PVC is a very good insulating material
- the PVC frames are made up of compartments to increase thermal performance of the profiles
- they can incorporate thick double glazing units of 24 to 30mm thickness with optimum size air gap of 12mm between sheets of glass, and
- they incorporate very high quality rubber seals throughout their window and door systems. These rubber seals aid thermal performance significantly as they 1) they isolate the double glazing from the PVC profiles and also 2) they stop air leakage between opening window sashes and door panels and the window and door frames themselves. → 36



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PVC windows perfectly suit double glazing as they generally have all of the following four critically important specifications

1. 22mm high glazing beads on the exterior of windows and doors to cover and protect the spacer bar edge of the double glazing units from the sun's rays and the resultant UV and infra red heat damage.
2. 6mm minimum gap between the edge of the double glazing unit and the adjoining glazing rebate in all PVC windows and doors – this provides the necessary water drainage channel to enable water to drain quickly and effectively to the exterior.
3. water drainage slots on the exterior of window and door frames of a minimum of 5mm high by 20mm wide.
4. anti blow back flap component on all exterior water drainage slots required in high and very high window zones (on the exterior of all window and door frames).

Fully manufactured PVC windows and doors are also being imported from China into Australia in containers in increasing volumes.

When choosing thermally efficient windows and doors this checklist of 11 options will be helpful.

Main factors -

Glass type. Options to consider to increase thermal performance:

1. Double glazing
2. Double glazing with high tech insulating foam spacer bars or thermally broken spacer bars (around the perimeter of the glass unit between the two panes of glass).
3. Double glazing with the 12 mm minimum and optimum air gap between both sheets of glass.
4. Double glazing with low emissivity glass (ie Low E glass).
5. Double glazing units which are filled with Argon gas between both sheets of glass. Thermally efficient Profile material that windows and doors are manufactured from. Options to consider:
6. Timber
7. PVC
8. Thermally separated aluminium (with plastic

bars in the centre of the aluminium profiles).

9. Timber inside and aluminium outside composite windows.

Secondary factors -

Rubber seals used in windows and doors.

10. Quality composite seals such as "Q-Lon" brand by Schegel, which perform exceptionally well at thermally separating the double glazing units from window and door profile material and also effectively stop drafts and significant heat loss.

Insulation between windows and door frames and the adjoining exterior walls of the home.

11. Use of expanding foam between window and door jambs and wall framing stops drafts and insulates this area well.

The best single piece of advice I can give home owners and architects when choosing windows and doors incorporating double glazing is to be 100% sure that all window and door profiles that your window manufacturer intends using fully complies with the minimum specifications and requirements of the Australian 'Insulated Glass Manufacturers Association' (IGMA) and the "normative and informative" sections of the current Australian Standard AS4666:2000. I suggest that you obtain a copy of the IGMA specifications to appraise yourself and that you obtain from your window and door suppliers written confirmation that their windows and doors are fully IGMA compliant. If minimum standards of window and door profile design, manufacturing and glazing are not met then the double glazing units throughout your home can break down within a short period the

double glazing manufacturers warranty will be voided. If your double glazing units do break down they fog up between the glasses, which looks unsightly, their thermal performance diminishes substantially, and the cost to replace the double glazing units throughout your home may cost you or your window and door manufacturer many thousands of dollars to replace.

The writer welcomes contact and provides free advice to any party including home owners, architects, window designers and window manufacturers on any issue relating to window system design or choice. Feel free to contact Sean by phone on +64 27 228 4211 or by e mail on sean@empowersoftware.co.nz

Sean O'Sullivan has an honours degree in business from Otago University - and has been involved directly in the window industry for over 16 years to date - working for two major window profile suppliers assisting 160 window and door manufacturers. Sean designed the window and door system suited to double glazing containing 10 patents and 20 registered designs, and sold to Fletcher Building, which is now manufactured by 90 window and door manufacturers. Sean is currently involved assisting timber window manufacturers in designing a timber window system solely suited to double glazing. Sean supports aluminium and timber window manufacturers in Australia and New Zealand with Empower time tracking and job scheduling 'productivity' software using PCs on the factory floor.

(1) The Productivity Commission inquiry into energy efficiency, by The Australian Glass and Glazing Association (download from www.agga.org.au/images/downloads/library/tycommissionsubmission.pdf). -S-

