

## Dispelling The Double Glazing Myths

### Breezway Technical Bulletin

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#### Background

As the stringency of the energy efficiency requirements of the National Construction Code (NCC, formerly known as the Building Code of Australia) have increased, an urban legend has emerged that double glazing is required to meet the requirements of the NCC.

#### Myth 1: Double Glazing is Required By The NCC

The NCC allows the compliance of windows with energy efficiency requirements to be shown in 2 different ways:

1. *Compliance via the Glazing Calculator.*

The Glazing Calculator assesses the interplay of the window's Solar Heat Gain Coefficients, U-values, sizes, orientations and shading to balance out heat gained and heat lost by the building through the windows. Compliance is calculated on a total-building-glazing basis for the Residential Glazing Calculator and on an orientation basis for the Commercial Glazing Calculator. No minimum values are set for each window.

2. *Compliance via modelling of the whole building.*

Approved Building Energy Rating Software is used to model the thermal performance of the entire building. As the performance of the entire building is modelled, better performance by one building element can compensate for lesser performance by another building elements. No minimum values are set for any element of the building envelope.

In most cases (particularly climate zones where there is a large difference between the outdoor temperature and comfortable indoor temperatures), lower (better) U-values may help to achieve compliance with the energy efficiency requirements of the NCC. If lower U-values are required, the NCC does not specify how those lower U-values must be achieved and options available to the designer include thicker single glazing, single glazing with low emissivity coatings, double glazing units or alternate framing materials.

Neither of the 2 glazing compliance options available in the NCC specify what type of glazing must be used.

#### Myth 2: Double Glazing Gives Better Thermal Insulation Than Single Glazing

The rate of non solar heat loss or gain through a window is measured on a whole-of-window basis (framing and glazing combined) and is measured by the U-value. A lower U-value indicates that the window has a greater resistance to heat flow and offers better insulation. WERS (the Window Energy Rating Scheme) is the recognised source of the U-values of window systems in Australia, with the ratings of around 3,000 window systems publicly available on the WERS website ([www.wers.net](http://www.wers.net)).

A review of selected aluminium window ratings available from the WERS website (see Appendix 1, correct at 10 April 2012) demonstrated that there are a range of double glazed windows with higher (worse) U-values than single glazed Altair Louvre Windows with Low E glass.

It is obvious then that, although double glazing can give lower (better) U-values, double glazing can also give higher (worse) U-values than single glazing with a Low E coating.

Myth 3: Double Glazing Always Improves The Energy Efficiency Of A Building

While it is true that windows with lower U-values will improve the energy efficiency of a building, it is not true that double glazed windows always have lower U-values than single glazed windows. (See Myth 2 and Appendix 1)

Myth 4: Double Glazing Is More Environmentally Friendly Than Single Glazing

While some (but not all) double glazed windows will improve the energy efficiency of a building, there are a number of other aspects of environmental friendliness where single glazed windows outperform double glazed windows:

1. *Raw material usage and embodied energy.*

By definition, double glazed windows have 2 panes of glass so require more total glass to manufacture. The spacers that hold the 2 panes of glass apart also require raw materials that would not be used for single glazed windows. Larger quantities of energy are required to produce larger quantities of raw materials.

2. *Transport efficiencies.*

Double glazed windows are heavier than single glazed windows. Machinery is therefore often required to handle double glazed windows and more energy is required to transport double glazed windows from the window fabricator to the building site.

Appendix 1: WERS Ratings Of Selected Aluminium Windows

WERS ID	Manufacturer	Window Type	Glazing	U-value
AWS-003-05	AWS	502/504 Slider	5/8/5	4.3
TND-001-12	Trend	Sliding	4/10/4	4.3
BRZ-006-08	Breezway	Altair Louvre in Easyscreen Frame	6LE	4.4
ALS-007-01	Alspec	101.6 Viewmax Sliding	4/8/4	4.4
AWS-008-05	AWS	516 Awning	5/8/5	4.4
BRD-002-01	Bradnam's	ESS Sliding (52mm)	4/6/4	4.4
GJA-014-01	G James	Type 131 Sliding	3/6/3	4.4
BRZ-003-13	Breezway	Altair Louvre in 52mm Frame	6LE	4.5
BRD-045-01	Bradnam's	SIG Sliding (100mm)	4/6/4	4.5
BRD-028-08	Bradnam's	ESS Awning	4/6/4	4.6
TND-060-01	Trend	Quantum Awning	4/16/4	4.6
TND-062-01	Trend	Quantum Casement	4/16/4	4.6
AIR-007-01	Airlite	Alum Sliding	3/6/3	4.7
ALS-018-16	Alspec	101.6 Mc Arthur Awning	6/12/6	4.7
TND-005-12	Trend	Quantum Awning	5/6/5	4.7
AWS-010-05	AWS	517 Awning	5/8/5	4.8
AIR-001-04	Airlite	Alum Awning	3/8/3	4.9
BRD-049-01	Bradnam's	ESS Awning (100mm)	4/6/4	4.9
ALS-023-01	Alspec	Hunter 100mm Awning	6/12/6	5.0
AIR-001-01	Airlite	Alum Awning	3/6/3	5.1
BRD-012-23	Bradnam's	ESS Casement	4/12/4	5.2
BRD-012-08	Bradnam's	ESS Casement	4/6/4	5.4