DOWELL ThermaLine™

energy efficient windows and doors

Awarded **HIA product of the year**
and approved by the
National Asthma Council
Australia's Sensitive Choice® program

HIA GreenSmart® AWARDS WINNER

WINDOW ENERGY RATING

HOUSE ENERGY RATING

NATIONAL ASTHMA COUNCIL AUSTRALIA
SENSITIVE CHOICE
SUPPORTING ASTHMA CARE

DOWELL
Our builders **know best**

Dowell has a long **proud history in the fabrication** and supply of windows and doors to the **Australian residential housing** market dating **back to 1860**.

***NatHERS Assessor**; A NatHERS Assessor is a professional trained and accredited in the use of NatHERS accredited software. Assessors use the software to determine the thermal performance of new residential buildings and major alterations or additions to existing residential buildings. An assessment by a NatHERS accredited assessor results in more environmentally friendly houses that consume less energy to heat and cool, are more comfortable to live in and also comply with the building regulations of the state or territory. Further information is available at http://www.nathers.gov.au and http://www.wers.net/wers-home*

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Dowell **Therma**Line™ was awarded **HIA product of the year 2012** and approved by the **National Asthma Council** Australia's Sensitive Choice® program

U-value is a measure of heat transfer/loss in a building element. Lower U-values indicate higher levels of insulation.

Dowell ThermaLine™
HIA PRODUCT OF THE YEAR 2012

For generations, the Dowell name has been synonymous with creating innovative window and door solutions in Australia.

Holding true to its name, Dowell added a sliding door and four new energy efficient windows into its ThermaLine™ range; the awning, multi-transom awning, sliding, and fixed windows. These windows and doors herald a new era in affordable, energy efficient design and in 2012 was awarded the HIA GreenSmart product of the year award.

HIA Judges stated; "ThermaLine™ Windows are a versatile, high performing and cost effective aluminium window range. The new ThermaLine™ frame has a similar thermal performance to the installed glass. With U_w-values* as low as 1.7, the windows are rated the best in its class. The low U_w-values benefit homes with large amounts of glazing to achieve 6 stars or better. The product range consists of an awning window, fixed window, slider window and sliding door designed to be a cost effective solution for energy savings to the residential housing market."

** Uw-value relates to the entire window and incorporates the U-values for the glazing 'Ug' and the frame 'Uf'.*

Reference source: Window Energy Rating Scheme [online] Available: www.wers.net.au, based on double glazed thermally broken aluminium windows and doors (13 November 2014).

Dowell **Therma**Line™

ASTHMA FRIENDLY

The Sensitive Choice® blue butterfly symbol is a way of recognising products and services that may be better for people with asthma and allergies.

Dowell ThermaLine™
ASTHMA FRIENDLY

Dowell ThermaLine™ windows and doors have been approved by the National Asthma Council Australia's **Sensitive Choice®** program. The Sensitive Choice® blue butterfly symbol is a way of recognising products and services that may be better for people with asthma and allergies.

Assessed by an independent panel, products and services carrying the butterfly have attributes that assist with reducing exposure to triggers.

Dowell is supporting the National Asthma Council Australia's efforts to improve asthma and allergy care.

In choosing a Dowell ThermaLine™ window or door you are choosing to lower the likelihood of condensation formation, thereby lowering the risk of dust mite and mould growth.

The Dowell ThermaLine™ range has exceptional air infiltration performance – an important factor if the conditions inside a home are to be strictly controlled.

Dowell ThermaLine™ windows and doors are double glazed, thermally broken aluminium frames. All Dowell ThermaLine™ products have been independently tested and verified in accordance with the Australian Window Association Windows Energy Rating Scheme (wers.net.au).

Dowell ThermaLine™
COMFORT

Dowell ThermaLine™
COMFORT

The Dowell ThermaLine™ window and door product range consistently produce very low U_w-values.

During winter or in cooler climates Dowell ThermaLine™ windows help reduce cool air entering the home and help keep warm air indoors. Condensation is reduced considerably, which often occurs as a result of large differences in temperature between the interior and exterior environments.

In summer or warmer climates Dowell ThermaLine™ windows help act as a buffer against the hot air outside, minimising the transfer of heat into a building. Dowell ThermaLine™ will help minimise the loss of cool air, reducing the size and need for air-conditioners.

Solar Heat Gain Co-Efficient (SHGC) is a measure of how much solar radiation passes through a window. For comfort during the summer months, the smaller the SHGC the better.

With SHGC's as low as 0.18* for the hotter climates and SHGC of 0.55* for the cooler climates, the Dowell ThermaLine™ range will help provide comfort in a home year-round and reduce the need for air-conditioning at home.

*Reference source: * Window Energy Rating Scheme [online] Available: www.wers.net.au, based on double glazed thermally broken aluminium windows and doors (13 November 2014).*

Dowell **Therma**Line™

FUTURE PROOFING BUILDINGS

Dowell ThermaLine™
FUTURE PROOFING BUILDINGS

In the past 100 years the low cost of energy has allowed architects to design buildings that can ignore natural ventilation, daylight and the suns energy, by replacing it with an artificial environment that is air-conditioned, humidified and artificially lit. This approach emerged through the harnessing of energy from fossil fuels, but with the move away from energy dependence this has translated into a fresh approach to housing design.

In Europe housing design has embraced the concept of Zero Energy Building (ZEB) as the response to changing environmental pressures. In general the term 'future-proofing' refers to the ability of something to continue to be of value into the distant future; that the item does not become obsolete.

Principles of future-proofing buildings

Some of the principles of future-proofing buildings include; Nil deterioration of existing materials by other structures or materials and products used in building construction, the encouragement of design flexibility, the building design adaptability in relation to the environment, consideration to the occupant needs, and future technologies.

Building design and features should enable a long service life and increase durability. Provide products with the capacity to meet future requirements and thereby reduce the likelihood of obsolescence. Taking into consideration the long term life-cycle benefits by calculating the future benefits against initial costs.

The term 'future-proofing' in relation to sustainable design began to be used in 2007. It has been used more often in sustainable design in relation to energy conservation to minimise the effects of future global temperature rise and/or rising energy costs. In the context of building, the term usually refers to the ability of a structure to withstand impacts from future shortages in energy and resources, increasing world population, and environmental issues, by reducing the amount of energy consumption in the building.

Reference source; Byrd, Hugh (2012) Energy climate buildings: an introduction to designing future-proof buildings in New Zealand and the tropical pacific. Transforming Cities, Auckland, New Zealand.

Dowell ThermaLine™ is part of the **global** approach to

improving building performance

Window design and performance in Australia has traditionally lagged that of Europe, North America and New Zealand. This has largely been driven by builders designing to price points that have not allowed some of the high performance window and door systems to be adopted in Australia.

In Europe the climate extremes and rising energy costs were pivotal in the adoption of higher standards of fenestration. In North America the oil shocks of the 70's and subsequent power blackouts saw the rapid adoption of the PVC double glazed windows and doors displacing aluminium systems. The North American window industry subsequently developed thermally broken aluminium products and a large share of the market was regained.

In most economies, regulation has played an important part as it has in Australia and New Zealand. In New Zealand, consumer demand has, however, overtaken regulatory requirements largely driven by the 'Future-Proof Build' programs that have seen double glazing dominate the new house window market. More recently, thermally broken systems have become popular, as design and performance have become critical in consumer purchasing and construction thinking.

The global approach to improving building performance has gained traction and these tend to be based on overall U-value for the building. Windows represent a large part of the building envelope area and become an increasingly critical design element to achieving the overall target U-value.

Dowell ThermaLine™

COMFORT WITH DESIGN FLEXIBILITY

Dowell ThermaLine™
MECHANISMS OF CHANGE

Regulation has been the main driver of change with mandatory requirements established. These have commonly been based on prescriptive codes based on U-values for individual construction elements.

In Australia, the Nationwide House Energy Rating Scheme (NatHERS) supports the efforts of the Australian Governments to reduce the energy and greenhouse gas impact of residential buildings. NatHERS encourages energy efficient building design and construction by providing a reliable way to estimate and rank the potential thermal performance of residential buildings in Australia.

Heating and cooling accounts for the majority of the average Australian household's energy use, but efficient building design can reduce the reliance on artificial temperature controls. To determine how efficient the design of a home is, it is given a star rating between zero and ten stars. Homeowners can make use of these ratings to determine modifications to existing houses or in planning the designs for a new house. The star rating is calculated using software accredited for this purpose under NatHERS. The software simulates expected conditions based on climate zones and other known factors about the location, occupancy and dimensions of the house. Allowances are made for different sized houses and different climates to ensure a fair comparison of buildings and consistent ratings across Australia. While the software can be used by anyone, only an assessor who has received NatHERS accreditation from a relevant organisation can provide a credible rating.

NatHERS tools provide one method of demonstrating compliance with the minimum energy efficiency standards for new residential buildings outlined under the National Construction Code (formerly the Building Code of Australia). Additionally, NatHERS software is a powerful tool for optimising energy efficient house designs for Australian climates. It also highlights the weakest link in the building envelope.

The Australian Window Energy Rating Scheme (WERS) audits and provides the window ratings used in building design and are available on the WERS website.

The concept of the ‘Passive House’ was developed in Germany in 1988 and aimed to set a much higher standard of energy conservation. The first houses were built in Darmstadt, Germany in 1990 and demonstrated a 90% reduction in space heating requirements.

Dowell ThermaLine™
PASSIVE HOUSE

The main difference between a passive house window and a standard window is that the windows within a passive house play an important role by reducing the heat loss from the house. Passive windows are insulated and trap solar gains within the building. Passive homes require double low-e or triple glazed windows to ensure the correct U-value is achieved. Insulated frames are also used to minimise heat loss and ensure the occupants comfort within the building.

Standard windows don’t have insulated frames and sometimes only have single or double glazing, by using these windows in a passive house the occupants will not be comfortable due to the huge temperature difference between the window and the wall, there might also be problems with thermal transfer and condensation.

The ‘Passive House’ standard requires that the building fulfills the following requirements:

1. The building must be designed to have an annual heating and cooling demand as calculated with the passive house planning package of not more than 15 kWh/m² per year (4746 btu/ft² per year) in heating and 15 kWh/m² per year cooling energy, or to be designed with a peak heat load of 10W/m².

2. Total primary energy (source energy for electricity) consumption (primary energy for heating, hot water and electricity) must not be more than 120 kWh/m² per year (3.79 × 104 btu/ft² per year).

3. The building must not leak more air than 0.6 times the house volume per hour (n50 ≤ 0.6 / hour) at 50 Pa (N/m²) as tested by a blower door.

Passive solar design can also be used to optimise the free energy from the sun. Depending on the expanse of glazing, orientation and available shading, it is likely that the window specification (glass and frame) required will be U_w 2.0 or below.

Of the three defined, a typical passive house accounts for as much as 50% of the heating and air-conditioning loads, and accounts for most of the discomfort due to draughts or excessive heat gains. A typical Australian home built before 2000 would likely achieve an airtightness test result in the realm of 10 air changes per hour (ACH), measured in a pressurised building (to 50Pa), and in many homes this can be up to 25 ACH.

Passive House: Karuna House, on the hilltops of Yamhill County, Oregon.

Zero Energy Building

A zero-energy building, also known as a zero net energy (ZNE) building, is a building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site. These buildings still produce greenhouse gases because on cloudy (or non-windy) days, or at night when the sun isn't shining, and on short winter days, conventional grid power is still the main energy source. Because of this, most ZNE buildings still get half or more of their energy from the grid.

Buildings that produce a surplus of energy over the year may be called 'energy-plus buildings' and buildings that consume slightly more energy than they produce are called 'near-zero energy buildings' or 'ultra-low energy houses'. Traditional buildings consume 40% of the total fossil fuel energy in the US and European Union, and are significant contributors of greenhouse gases. The zero-energy goal is becoming more practical as the costs of alternative energy technologies decrease and the costs of traditional fossil fuels increase.

The development of modern ZNE buildings became possible, not only through the progress made in new energy and construction technologies and techniques, but also improved by significant scientific research, which collects precise energy performance data on traditional and experimental buildings and provides performance parameters for advanced computer models to predict the efficacy of engineering designs.

Heating and insulating buildings

Architects need to know how well different materials will insulate the building they design. To help them with this they need to know the U-values of different materials.

A U-value of 1 W/(m^2 ºC) means a 1 metre square area of the material with a 1ºC temperature difference across the material will conduct heat at a rate of 1 joule per second.

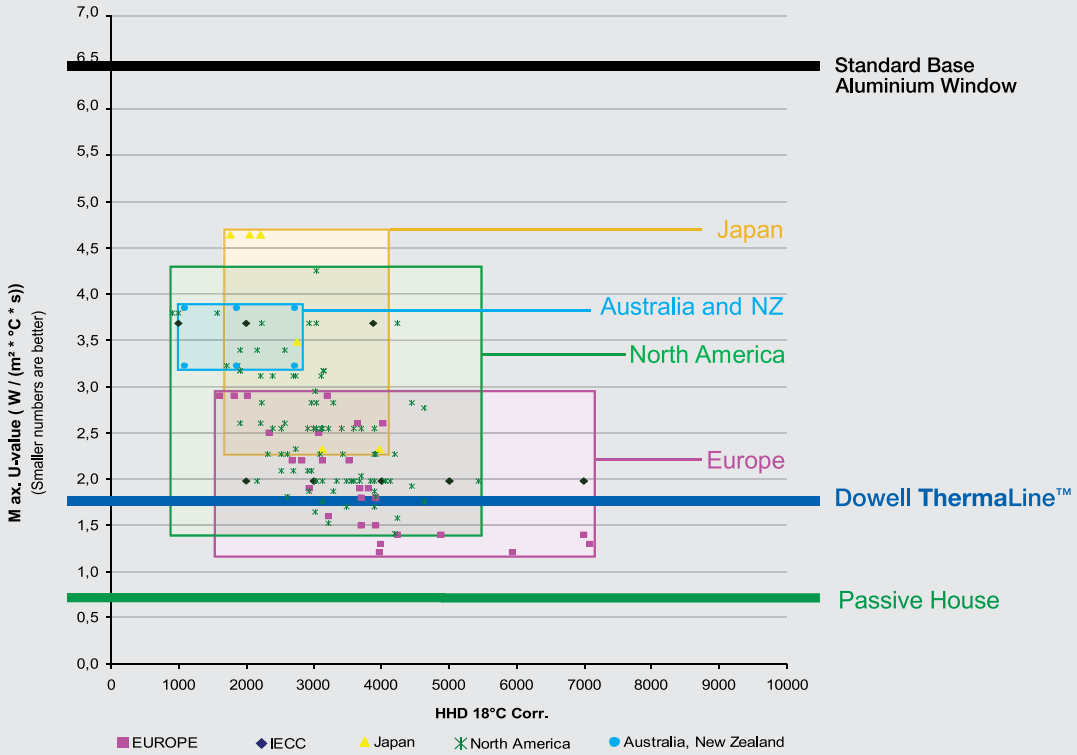
U-values measure how effective the properties of the insulating materials are. The lower the U-value the better the material is at insulating.

U-values for windows (U_w-values)

Dowell ThermaLine™ windows and doors have been designed to allow building designers to achieve energy efficient designs. They are efficient in terms of U_w-value and also air leakages rates to minimise heating and cooling loads.

Reference source; 1. Building Connection Magazine (Winter 2014 Issue), 'Building a Passive House'; 2. Passive House Builders [online] Available: www.passivehousebuilder.com (13 November 2014)

Dowell ThermaLine™
U-VALUES



U-values for windows

■ **U_w-Value 0.7** - Passive House is energy neutral. It requires no energy use for heating or cooling.

■ **U_w-Value 1.7** - Dowell ThermaLine™ U_w-value of 1.7 out performs its competitors and has U_w-values suitable for Europe regions with very cold climates.

■ **U_w-Value 6.5** - Standard single glazed aluminium window (NOT thermally broken) has U_w-value of 6.5

HHD 18ºC Corr. - This is how many hours in the year the tempreture is below 18ºC.

Reference source: Laustsen (2008), OECD/IEA information paper: Energy Efficiency in Building Codes and Policies for Energy Efficiency in New Buildings, with diagram modification (show thermally broken aluminium awning window U_w-values).

Dowell ThermaLine™ U-VALUES

Reference source: John Brennan [online] Available: www.architecture.com/RIBA/Aboutus/SustainabilityHub/Designstrategies/Earth (13 November 2014)

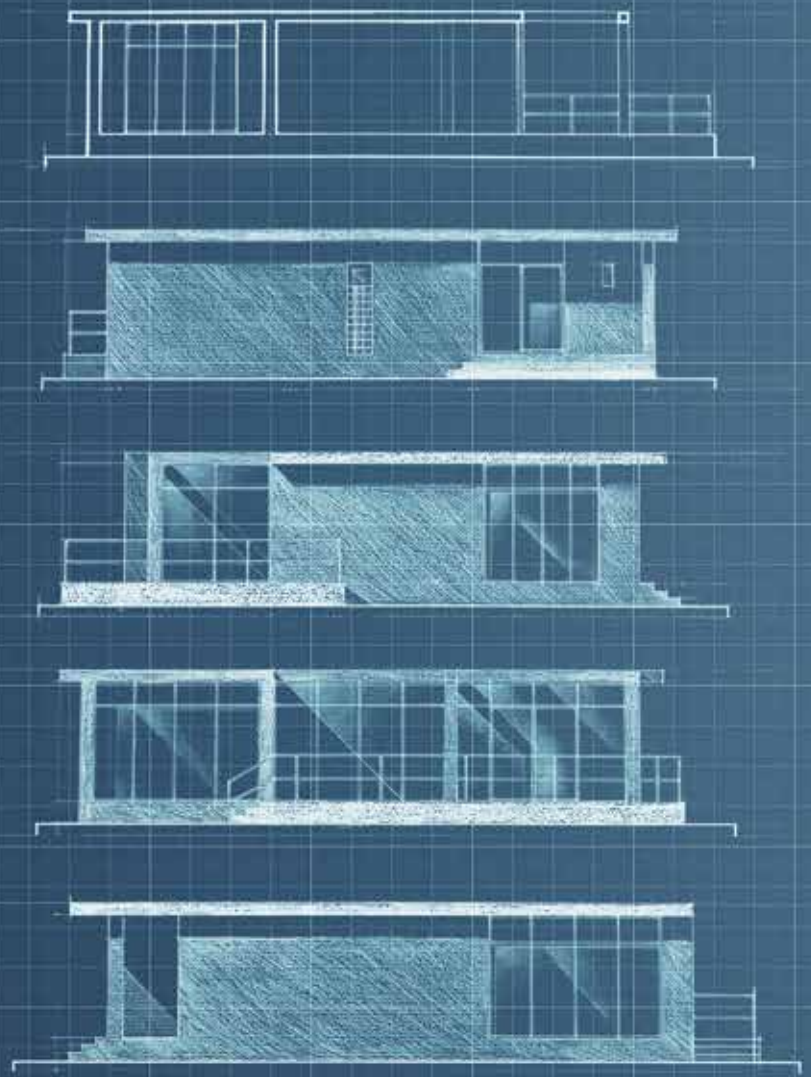
What is a U-value?

A U-value is a measure of heat transfer/loss in a building element such as a wall, floor or roof. It can also be referred to as an 'overall heat transfer co-efficient' and measures how well parts of a building transfer heat. This means that the higher the U-value the worse the thermal performance of the building envelope. A low U-value usually indicates high levels of insulation. They are useful as it is a way of predicting the composite behavior of an entire building element rather than relying on the properties of individual materials.

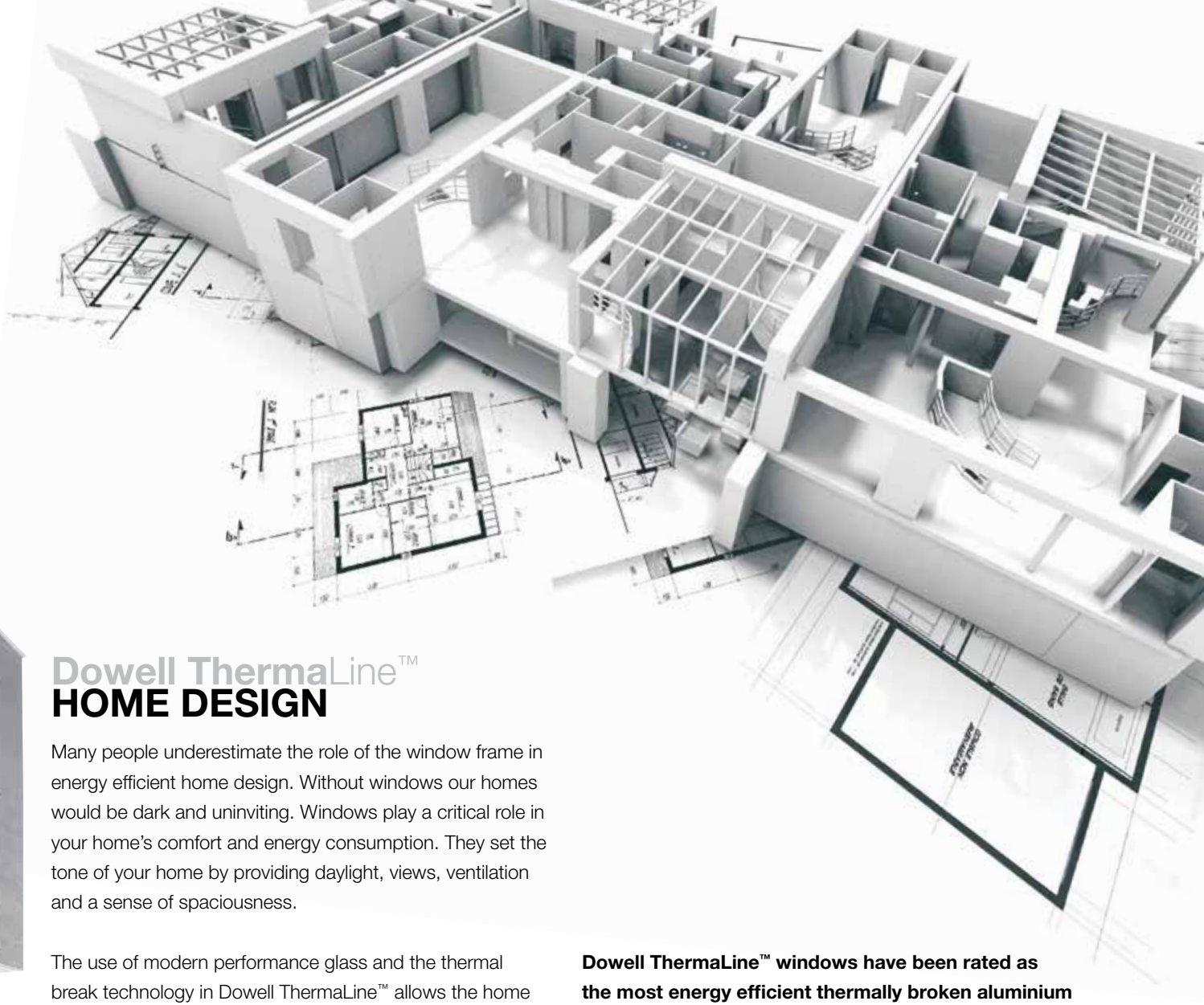
Why use U-values?

U-values are important because they form the basis of any energy or carbon reduction standard. In practice, nearly every external building element has to comply with thermal standards that are expressed as a maximum U-value. Knowledge of how to simply calculate U-values at an early stage in the design process, avoids expensive re-working later on in a project. It allows the designer to test the feasibility of their project at an early stage to ensure it is fit for purpose and will comply with regulatory frameworks.

Dowell ThermaLine™
HOME DESIGN



We all love windows and the natural light they provide, their connection to the outdoors, providing ventilation and a sense of space. In the past a lack of thermally efficient window systems has meant architects and designers have had to compromise the amount of windows in their design in order to meet energy regulations. More and bigger energy efficient windows and doors are now possible with Dowell ThermaLine™.



Dowell ThermaLine™
HOME DESIGN

Many people underestimate the role of the window frame in energy efficient home design. Without windows our homes would be dark and uninviting. Windows play a critical role in your home's comfort and energy consumption. They set the tone of your home by providing daylight, views, ventilation and a sense of spaciousness.

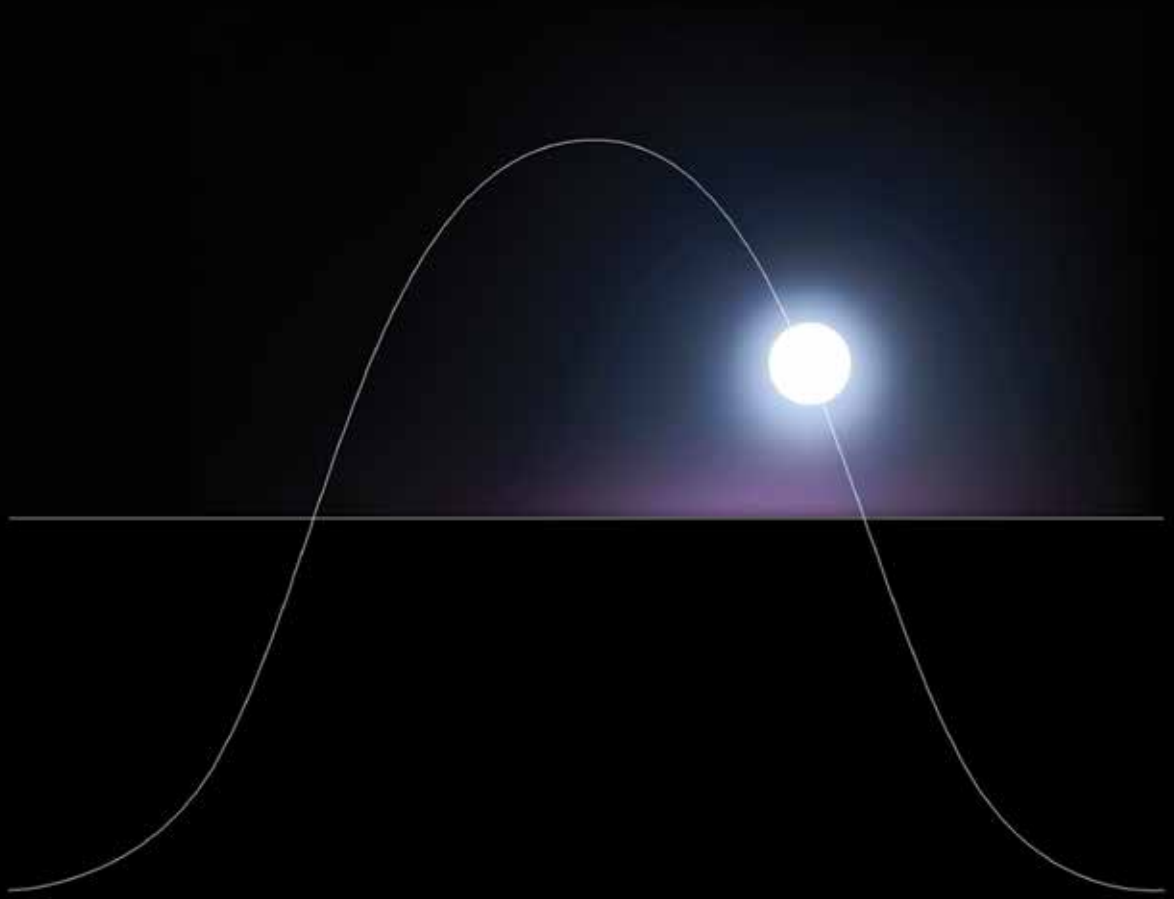
The use of modern performance glass and the thermal break technology in Dowell ThermaLine™ allows the home owner to have large windows while delivering outstanding energy efficiency and comfort. In fact, the most energy efficient windows result from a combination of both an insulated frame and the right glass to achieve superior energy performance.

Dowell ThermaLine™ windows have been rated as the most energy efficient thermally broken aluminium windows on the Australian residential market today, based on a glass to glass comparison*.

*Reference source: * Window Energy Rating Scheme [online] Available: www.wers.net.au, based on double glazed thermally broken aluminium windows and doors (13 November 2014).*

Dowell ThermaLine™
THE SUN-PATH

By analysing the impact of the sun on a site, as well as the building's location, the spatial arrangement, orientation, window placement, daylight access and other design features, the designer can take full advantage of passive solar design features and increase the energy efficiency and comfort of the building.



Dowell ThermaLine™
THE SUN-PATH

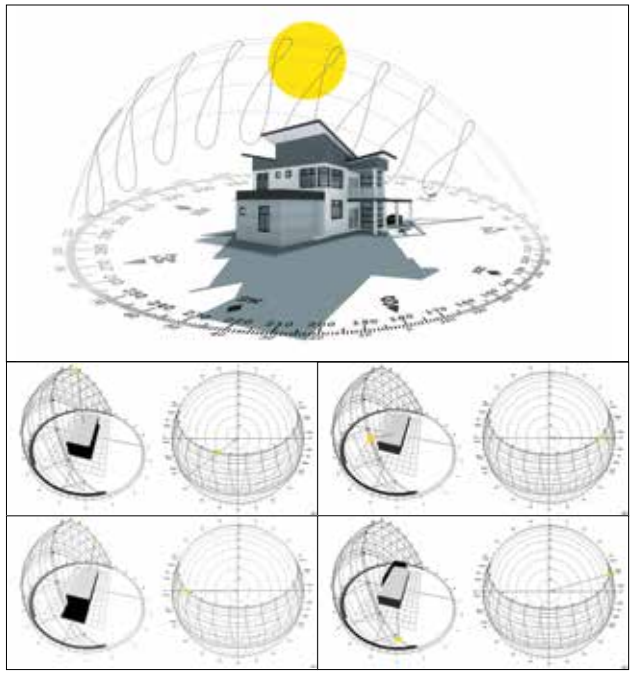
The simplest way to assess the passage of sun across a site is by observation. A site visit can also help identify site-specific conditions, how obstructions such as adjacent buildings, trees and landforms will impact on the site and the potential design, how the site's shape, slope and orientation affect solar access.

Sun-path diagrams provide a broader overview of the sun on a site, as they map the path of the sun across the sky at different times during the day throughout the year. They can help establish the position of the sun relative to a site and can be used to determine the effect of shadows cast by buildings, trees and landforms on and around the site.

In the sun-path diagrams, the centre is the point of observation and the arcs represent the sun's altitude angle at different times of the day throughout the year, using a 24 hour clock (12 hours ahead of GMT), rather than solar time. They are accurate to approximately 1 degree north or south of the allotted latitudes, however it is important to have accurate contour lines when using them.

Altitude and azimuth

The position of the sun with respect to an observer is commonly represented by two angles – altitude and azimuth. Altitude is the angle of the sun's rays compared with the horizon. At sunrise and sunset, the altitude is zero, and in the southern hemisphere, the maximum altitude of the sun at any specific location occurs at solar noon on 21/22 December (longest days of the year).

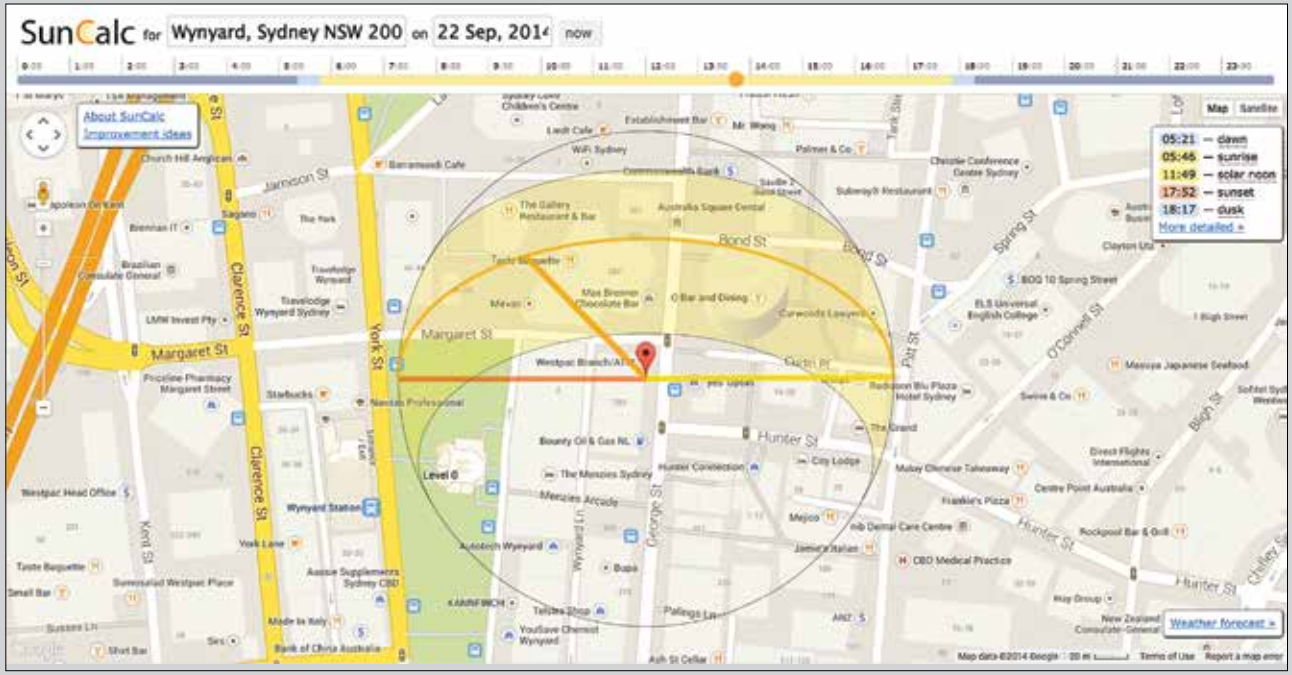


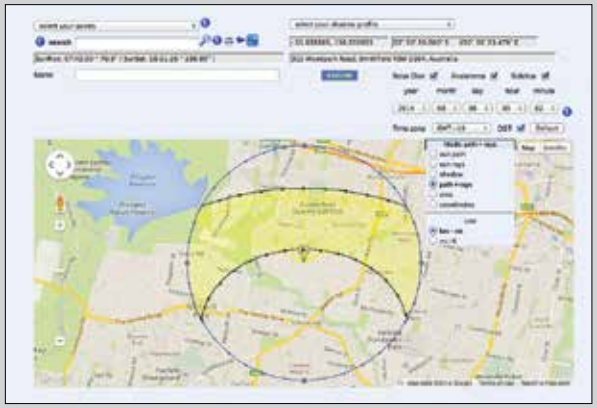
Sun-path diagram are created to show the suns path, direction, angle and temperature at specific times during winter and summer.

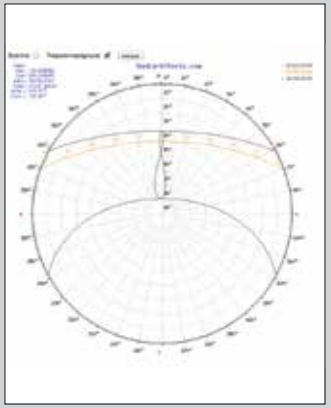
Azimuth (sometimes known as bearing) is the direction of the sun as shown on a compass. Solar or ultraviolet (UV) radiation is the energy from the sun. The amount of solar radiation available on a site depends on the latitude and the sunlight hours received.

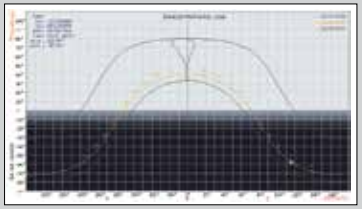
Shade is often required in summer, but in most parts of the country, winter sun is desirable. Obstructions on a site may block sunlight access at times when it is required.

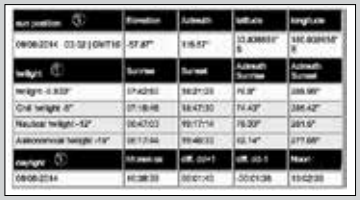
When considering sunlight and building design, assess the impact of obstructions in the future as well as the present. For example, a small tree on an adjacent site may grow into a large one that blocks sun, a building may be erected on a currently vacant site or an existing building may be demolished and replaced by a larger one. Alternatively, existing trees may be retained for summer shade.











Calculating the sun-path

Using web based tools to calculate the sun path can easily determine which window configuration would be most suitable on a particular side of the building. Resulting in a clever design combination of Dowell Thermaline™ and Dowell standard double glazed or single glazed windows to achieve maximum cost-energy efficiency building solution.

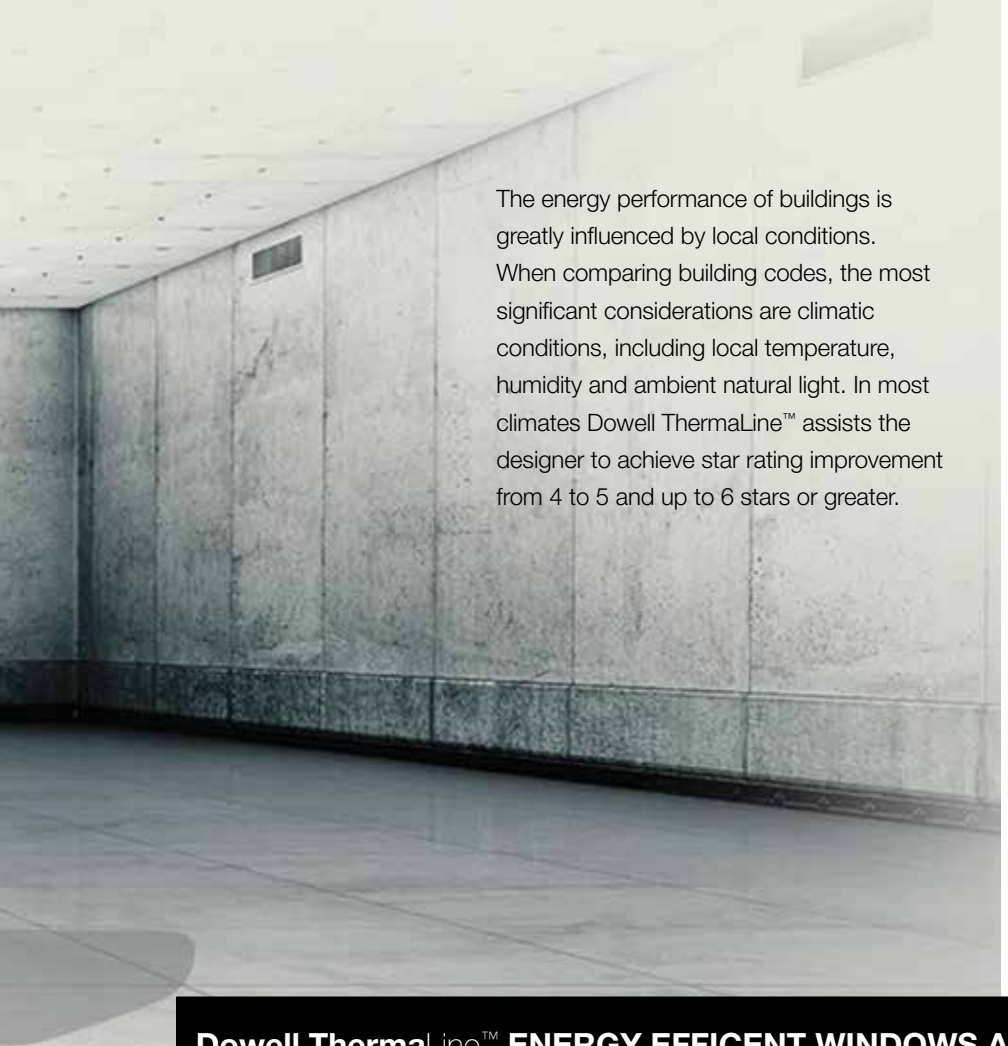
Far top: www.suncalc.net, SunCalc is an app. that shows sun movement and sunlight phases, during any given day at a given location.

Above left, center and right: www.sunearthtools.com, Collection of tools to know and work with solar energy. Calculation of: sun position, latitude longitude coordinates, photovoltaic systems, emissions CO2. See sun positions at sunrise, specified time and sunset.

Reference source: Level, SunCalc and Sunearthtools.com; [online], Available: www.level.org.nz/site-analysis; www.suncalc.net; www.sunearthtools.com (13 November 2014).

Dowell **Therma**Line™

ENERGY RATING



The energy performance of buildings is greatly influenced by local conditions. When comparing building codes, the most significant considerations are climatic conditions, including local temperature, humidity and ambient natural light. In most climates Dowell ThermaLine™ assists the designer to achieve star rating improvement from 4 to 5 and up to 6 stars or greater.

Dowell ThermaLine™ ENERGY EFFICENT WINDOWS AND DOORS

Product	Number of products rated by WERS	Dowell ThermaLine™ ranking
Awning window	7,016	* **Top 6** windows are Dowell ThermaLine™
Sliding window	19	* **Top 5** windows are Dowell ThermaLine™
Sliding door	6,580	* **Top 4** windows are Dowell ThermaLine™

** As verified by the Windows Energy Rating Scheme (WERS). Reference source: WERS [online] Available: www.wers.net.au, based on thermally broken aluminium windows and doors (13 November 2014)*

Dowell ThermaLine™ ENERGY RATING

Attaining energy efficiency within your home offers a powerful and cost-effective tool for achieving a sustainable energy future. Improvements in energy efficiency can reduce the need for investment in energy infrastructure, cut energy bills, increase comfort and improve ones personal health. Other environmental benefits can also be achieved by the reduction of greenhouse gas emissions and local air pollution.

With an ever-increasing need to find the most effective ways to design and build more energy efficient homes, choosing a Dowell ThermaLine™ energy efficient window is an easy solution.

Dowell ThermaLine™ superior thermal performance allows you to add more windows or more floor area without compromising home energy ratings, helping create a brighter and more spacious home environment.

Limited ability to change orientation on some building sites requires high performance windows. The design can either increase window size or increase energy rating or a combination of both.

Dowell ThermaLine™

HEAT LOSS

Fig 1. Glass with thermal properties reflect heat back into the room keeping energy consumption down.

Fig 2. Ordinary glass allows heat to escape. Shown in actual thermal images Fig.3 & 4.

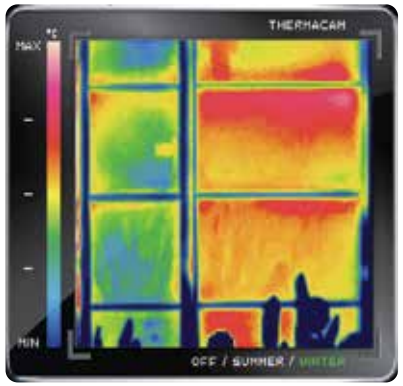
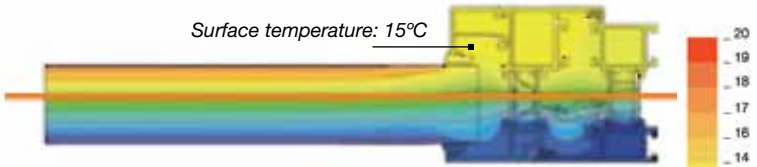


Fig 3. Winter thermal image.

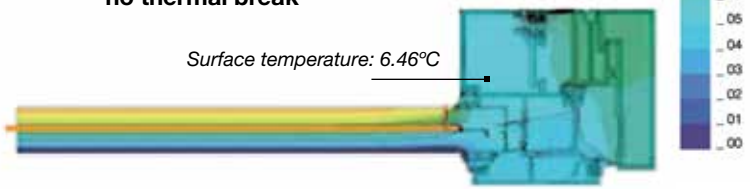
Fig 4. Summer thermal image.

Isotherm of Dowell Thermal Line™
- thermally broken *aluminium*



- Even distribution of isotherm lines means a stable system.
- The neater the lines the more stable and therefore less heat loss

Isotherm of standard aluminium window
- no thermal break



- The isotherm diverges where the glass meets the frame
- Such huge divergence means more heat loss

Dowell ThermaLine™
HEAT LOSS

As much as 49% of the heat lost during winter and as much as 87% of the heat gained during summer can come from the windows*.

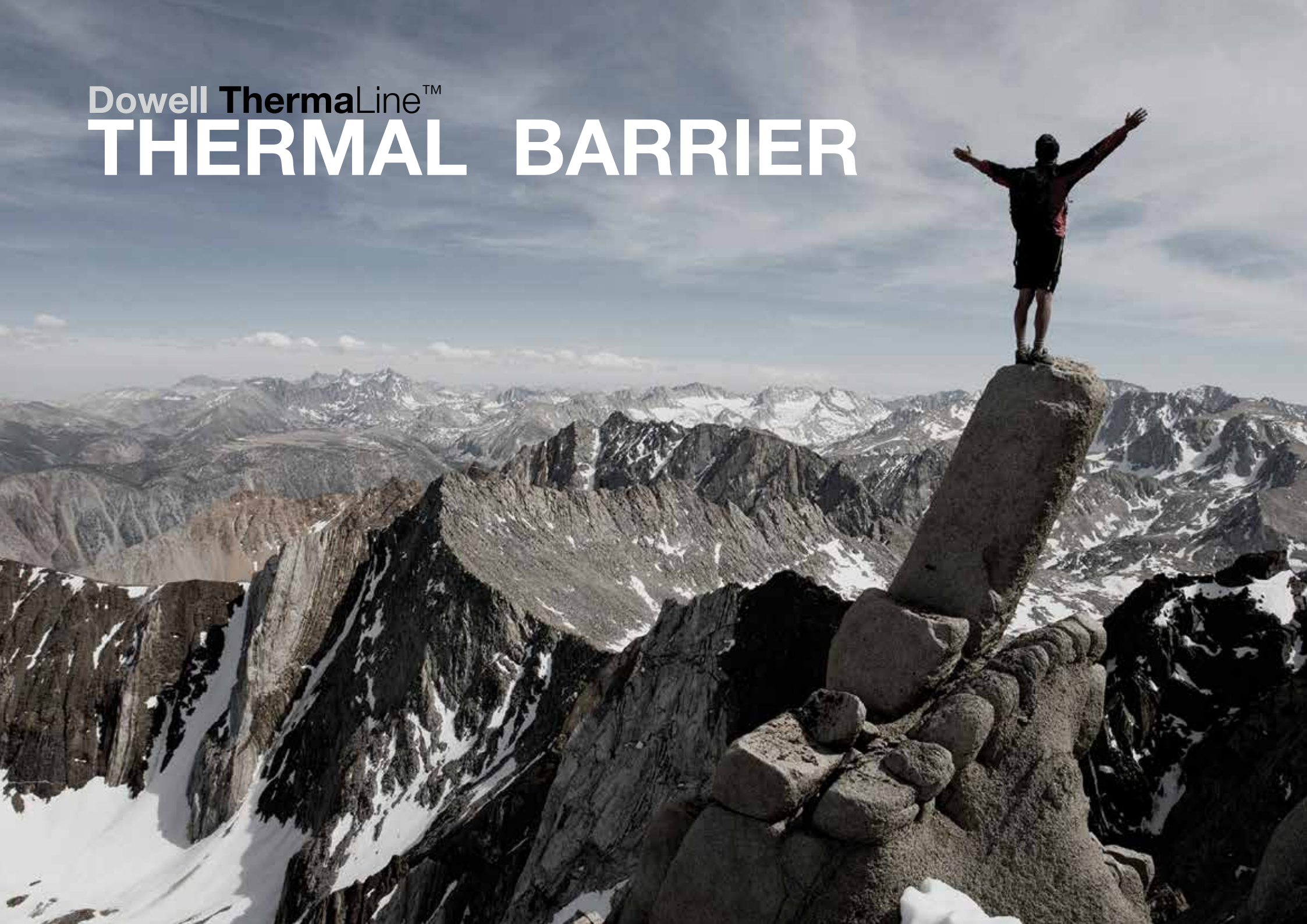
In Melbourne around 75% of household energy usage is for heating, while around 90% of energy is used for cooling homes in Brisbane. The emphasis on selecting the right product to reduce heat loss in a colder climate and reduce heat gain in a hotter climate should be an important decision to achieve greater comfort and energy efficiency. Choosing the right product and glazing option will help.

The award winning Dowell ThermaLine™ product range with its custom glazing options provides outstanding comfort, noise reduction and energy efficiency, all factors that are highly desired when constructing a new home or renovating an old one.

*Reference source: * Australian Window Association [online] Available: www.awa.org.au/resources/windows-for-good-energy-efficiency; www.efficientglazing.net; (13 November 2014); Testing based on an average house containing 8% area of glazing in the entire building fabric (windows, walls, floor and roof).*

Dowell **Therma**Line™

THERMAL BARRIER



Hot climate simulator

Hot and cold climate simulators: *Demonstrates (in extreme conditions) optimal thermal performance and effectiveness of the complete Dowell thermal break technology in all parts of the window.*

Cold climate simulator

Dowell ThermaLine™
THERMAL BARRIER

The Dowell ThermaLine™ thermal barrier is made of high quality polyamide and glass fiber construction providing superior insulation and geometry tolerance. Polyamide has high mechanical strength and exceptional heat, UV and chemical resistance, which ensure the thermal strip's geometry tolerance.

The glass fiber compound makes the thermal barrier strip durable, but most of all it matches the thermal barrier strip's Linear Thermal Expansion Co-Efficient (LTEC) with that of the aluminum's. The thermal barrier geometry affects the quality of composite profile. A thermal break with poor geometry results in poor geometry of the composite profiles which also has built-in stress, leading to poor performance such as air tightness, water tightness and wind resistance.

Complete thermal breaks in all parts of the window, ensure there is optimal thermal performance.

Dowell ThermaLine™ CONDENSATION

Dowell ThermaLine™ CONDENSATION

Creating a healthy and comfortable living environment, by use of effective building design to reduce condensation and the likelihood of mould growth.

Reference source: Dowell management using, Dowell ThermaLine™ data and Bureau of Meteorology, extracts from CSRO 'Building Technology File 2001' and Dept. of Health, WA 'Mould and condensation in your home'.

Condensation arises because warm air can hold more moisture than cold air. For example, air at 25°C can hold about 20 grams of water per kilogram of air. This is its maximum water content so it corresponds to 100% humidity. If air in this state is cooled to 15°C, then its maximum water content falls to about half this value and about 10 grams of water must condense out of each kilogram of air. This will occur as a fog of liquid droplets if the air is cooled as a mass, or as condensation on a surface if that surface provides local cooling of the air around it.

Common examples of surface condensation include; condensation upon a window glass and/or aluminium frame as a result of the reduced temperature of the glass and/or aluminium frame in a warm environment or as a result of increasing moisture levels within the room.

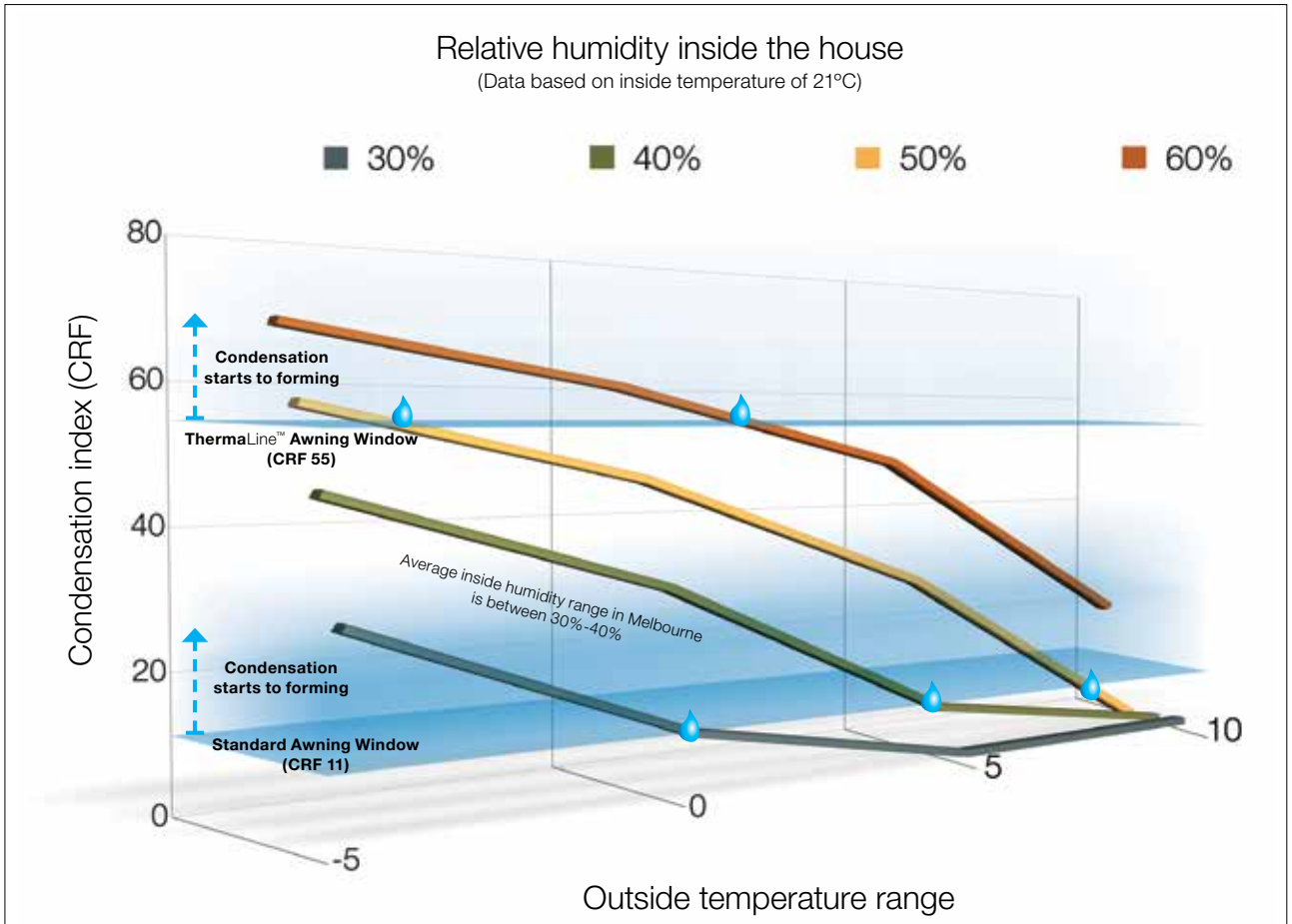
If air is cooled below its dew point (i.e. cooled to a temperature where its relative humidity would exceed 100%, so that it cannot contain all of the water originally present), then a fog or condensation will occur. If the air is relatively moist then the dew point temperature will not be far below the actual air temperature, so condensation occurs readily. Drier air will have a dew point which is proportionately low, so that condensation will only occur if it comes into contact with surfaces which are much colder.

Condensation in buildings

The ingredients for condensation are essentially one or more of the following:

- The presence of moisture levels which are too high.
- The low temperatures of building materials.
- Uncontrolled flow of water vapour from a source to a region of cold temperature.

Moisture levels within buildings are often higher than outdoors, and there are numerous reasons for this. One source of moisture is the ground. Concrete slabs generally provide a waterproof barrier to ground moisture, but buildings with suspended timber floors (typical of many houses) are quite susceptible to high indoor humidity arising from moist sub-floor spaces. Domestic activities produced by; cooking, bathing, showering, drying,



		Typical humidity increase due to internal activity		
		Internal humidity		
		40%	**50%**	**60%**
Aluminium window frame condensation dewpoint temperature	Conventional aluminium frame with double glazing	4ºC	8ºC	12ºC
	Dowell ThermaLine™ aluminium frame	-10ºC	-4ºC	2.5ºC

high occupancy, high indoor plant concentrations, uncontrolled moisture ingress and domestic appliances such as gas or oil fired stoves, burners and heaters.

Typical quantities of water vapour produced in the home are (in litres per hour):

- Adult (breathing) 0.1
- Hot bath 1.5
- Clothes drier 5.0
- Hot shower 10.0

Condensation on inside surfaces is generally a winter (or heating season) problem. Insufficiently insulated surfaces become cold enough to fall below the dew point of indoor air and condensation necessarily occurs. Aluminium window frames are particularly susceptible because they 'face out' on a cold day/night.

As shown in our diagram (based on 21ºC internal temperature), the dew point (start of condensation), is when the outside temperature is at 8ºC for a standard aluminium frame and at -4ºC for a Dowell ThermaLine™ thermally broken aluminium awning window, when humidity inside a home increases due to activity such as people breathing, cooking, showering and drying - with typical internal humidity being around 50-60%. Even in extreme internal humidity level of 60%, Dowell ThermaLine™ dew point is not achieved until the outside temperature falls below 2.5ºC.

Dowell ThermaLine™ thermal barrier reduces moisture build-up and the unsightly mould growth that cause respiratory illness or asthma, chronic cough, rashes (dermatitis) and sinus problems, caused by internal surface condensation.

Dowell ThermaLine™

TECHNOLOGY

Dowell ThermaLine™
TECHNOLOGY

Dowell ThermaLine™ is fully insulated with complete thermal breaks in all parts of the window ensuring there is optimal thermal performance.

Over 400 iterations of thermal modelling were carried out to optimise design characteristics, Dowell ThermaLine™ has been developed and designed from start-to-finish by Dowell's team of engineers and design specialists. Dowell's extensive manufacturing experience has ensured the Dowell ThermaLine™ range can be manufactured economically with exceptional quality standards.

Outstanding air infiltration performance is achieved through meticulous design and incorporation of bulb seals means the Dowell ThermaLine™ products have excellent air infiltration performance. This is important as air leakage can negate the benefits of great thermal performance.

Dowell ThermaLine™

PERFORMANCE

- ✓ Standard colours with selective options
- ✓ Wide frame system
- ✓ Thermally modeled high performance design
- ✓ Multi-void thermally efficient frame
- ✓ Polyamide thermal break
- ✓ High performance air sealing
- ✓ Noise control
- ✓ Bush fire rated
- ✓ Heating climate
- ✓ Mixed climate
- ✓ Cool climate
- ✓ High future value benefit
- ✓ Condensation control
- ✓ National Asthma Council 'Sensitive Choice®' program approved

Dowell ThermaLine™ PERFORMANCE

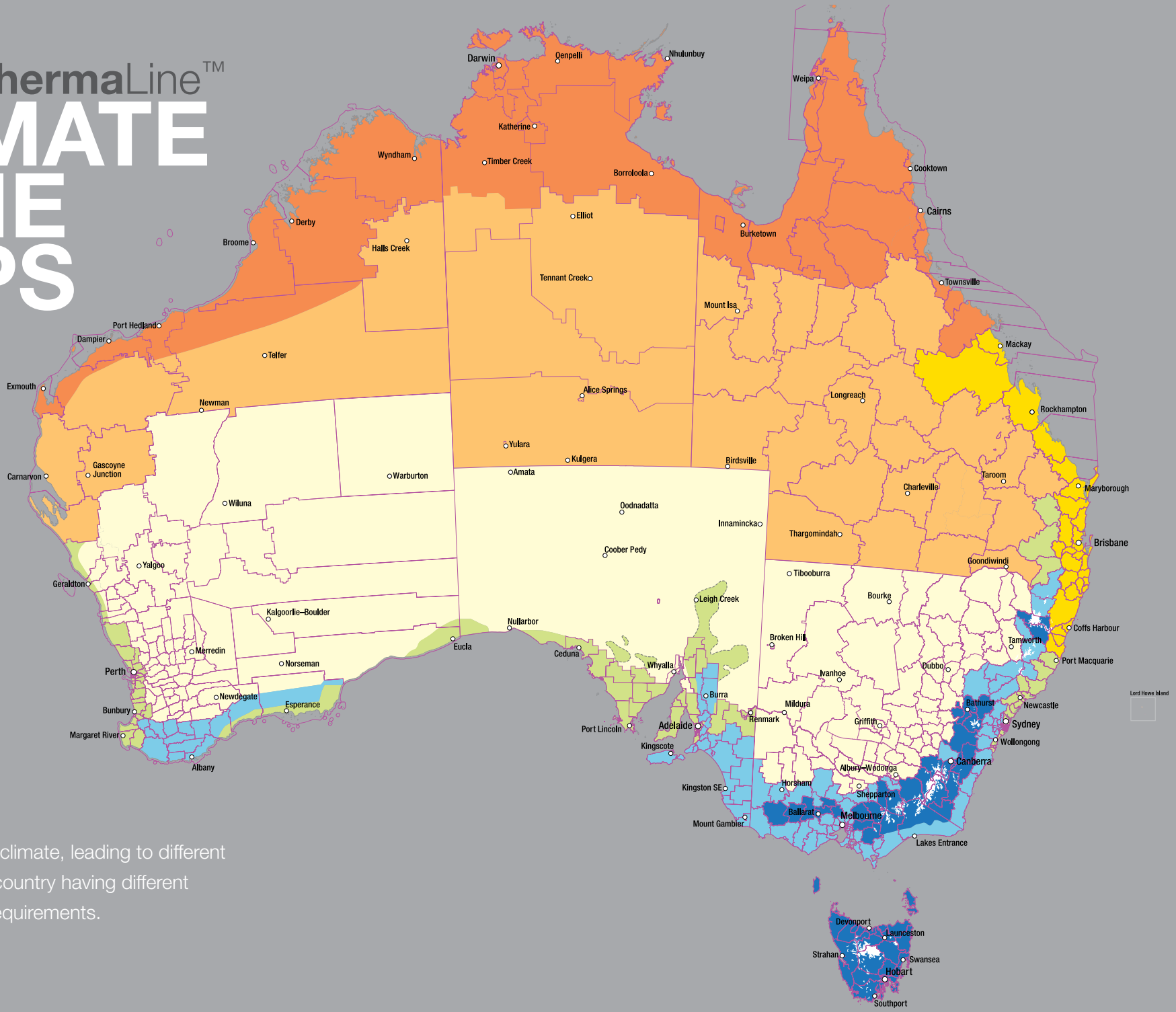
A Dowell ThermaLine™ window is so much more than just the glass and many people underestimate the role of the window frame in energy efficient home design. In fact the most energy efficient windows result from a combination of both an insulated frame and the right glass to achieve superior energy performance.

The Dowell ThermaLine™ frame is made with aluminium – a uniquely strong, lightweight, ductile, corrosion resistant material that can also be recycled – with insulation properties added into the frame to ensure minimal transfer of heat.

The thermal break technology in Dowell ThermaLine™ is created using a highly engineered polyamide (plastic) strip that acts as a thermal barrier between the outer and inner aluminium components of the window frame. This minimises the transfer of heat and cold through the window frame, resulting in improved energy efficiency.

To better meet the needs of our customers. Dowell ThermaLine™ offers a range of double glazed glass options.

Dowell ThermaLine™
CLIMATE ZONE MAPS



Australia has a varied climate, leading to different locations around the country having different heating and cooling requirements.

Energy efficiency Deemed-to-Satisfy (DtS) provisions vary from location to location and for simplicity, locations with approximately similar climates have been combined into eight climate zones.

The following provides a brief description of each National Construction Code (NCC) climate zone:

	Zone	Description
	1	High humidity summer, warm winter
	2	Warm humid summer, mild winter
	3	Hot dry summer, warm winter
	4	Hot dry summer, cool winter
	5	Warm temperate
	6	Mild temperate
	7	Cool temperate
	8	Alpine

Hot climate zones 1, 2 & 3
Areas included in these climate zones are
Northern Australia, Brisbane, Darwin

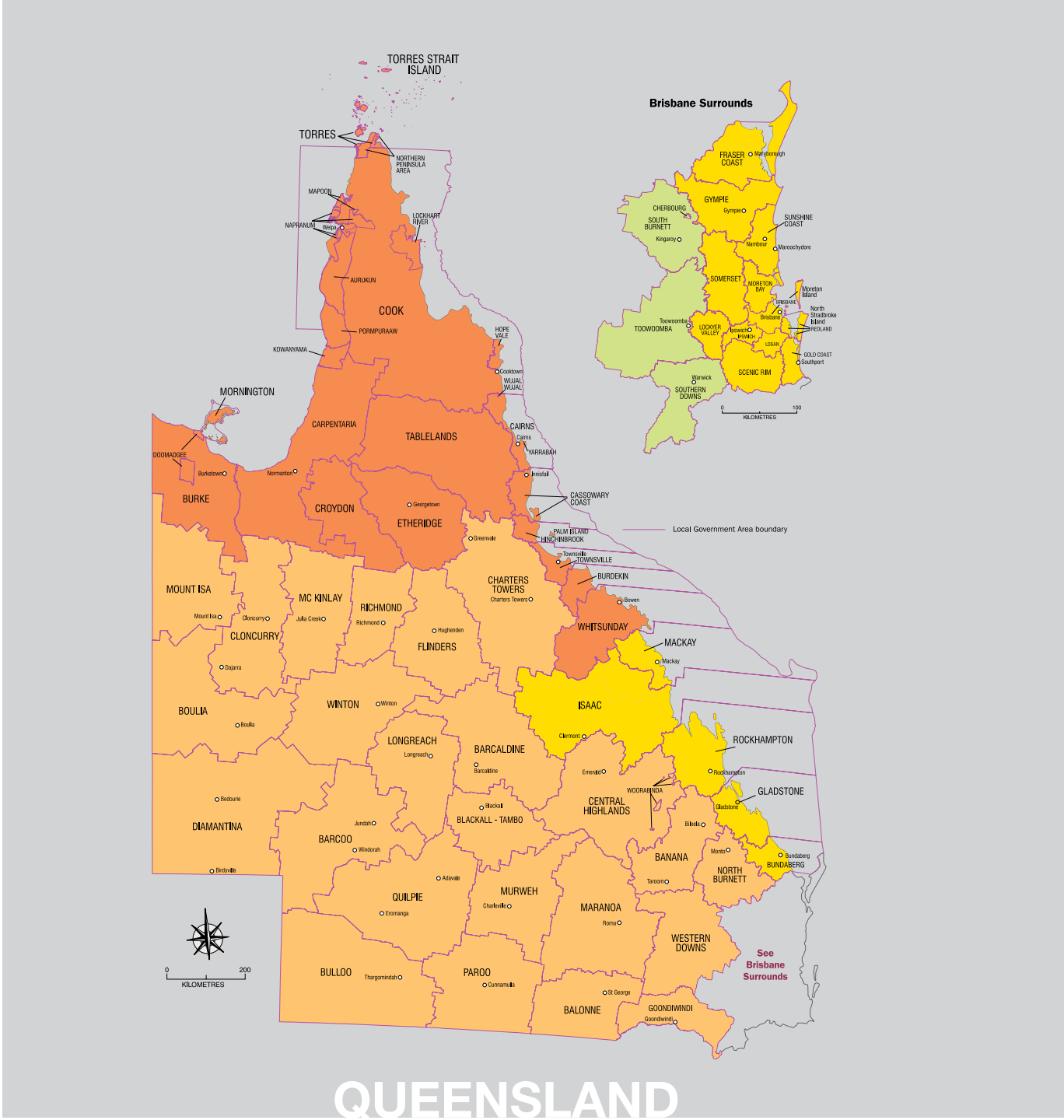
Zone			U_w-value	SHGC	Glazing
1	2	3	*Low 4.5 to 6.5	*Low 0.3 to 0.60	Tinted, tint IGU, high performance tint, tinted low-e (low gain), tint IGU low-e (low gain)

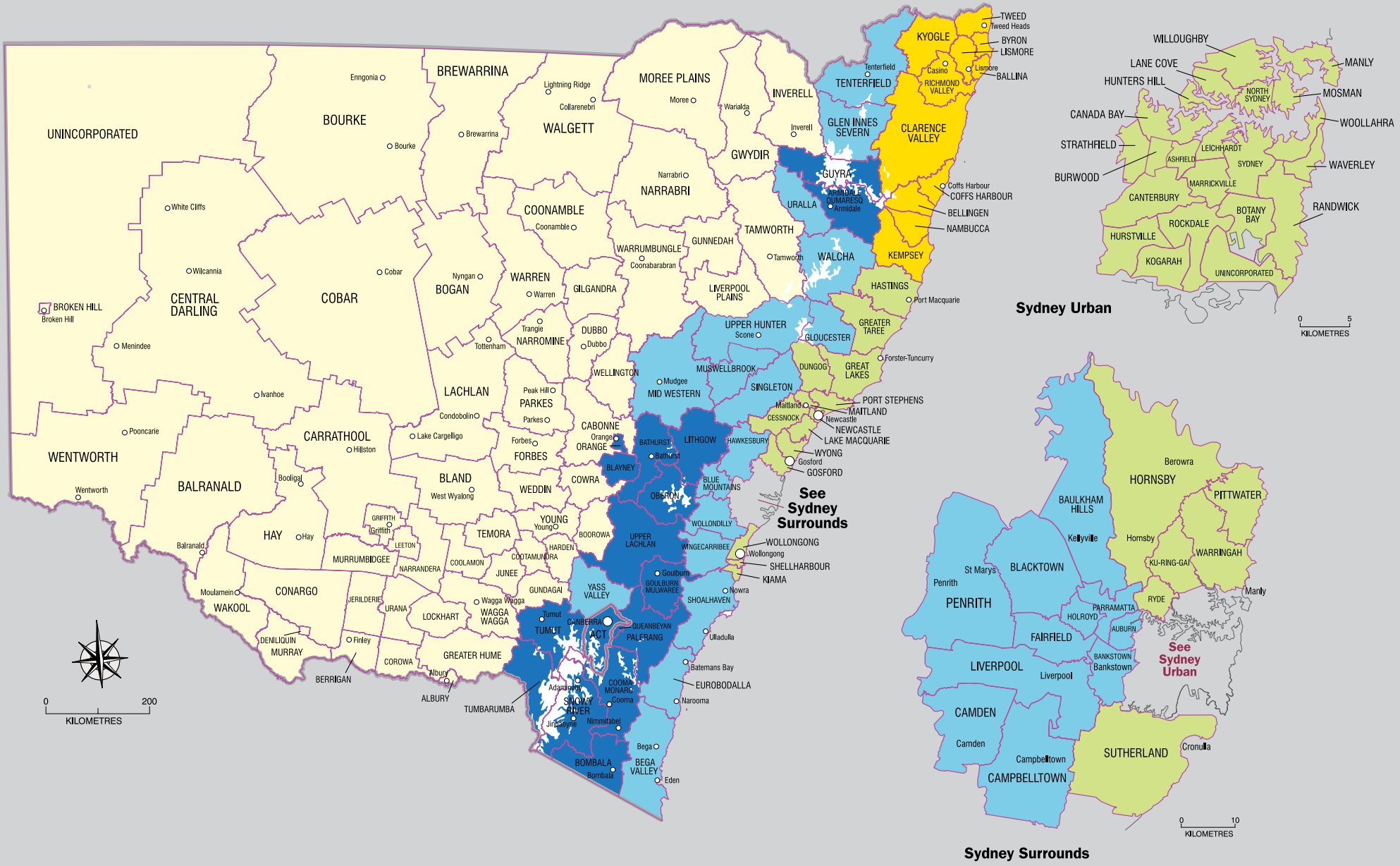
** Dowell suggested thermal performance ranges.*

These eight climate zones are illustrated in the form of a climate zone map which was created using Bureau of Meteorology climatic data, with two supplementary zones added to accommodate an additional temperate zone and alpine area.

Local Government Area Boundary
Aboriginal and Torres Strait Islander Local Government Area Bodies

Reference source:Maps have been developed from maps produced by the Australian Building Codes Board and the Bureau of Meteorology..





NEW SOUTH WALES

VICTORIA

The following provides a brief description of each National Construction Code (NCC) climate zone:

	Zone	Description
	1	High humidity summer, warm winter
	2	Warm humid summer, mild winter
	3	Hot dry summer, warm winter
	4	Hot dry summer, cool winter
	5	Warm temperate
	6	Mild temperate
	7	Cool temperate
	8	Alpine

Hot climate zones 1, 2 & 3

Areas included in these climate zones are Northern Australia, Brisbane, Darwin

Zone	U_w-value	SHGC	Glazing
1 2 3	*Low 4.5 to 6.5	*Low 0.3 to 0.60	Tinted, tint IGU, high performance tint, tinted low-e (low gain), tint IGU low-e (low gain)

** Dowell suggested thermal performance ranges.*

Mixed climate zones 4 & 5

Areas included in these climate zones are Sydney, Perth and Adelaide

Zone	U_w-value	SHGC	Glazing
4 5	*Low 3.5 to 6.5	*Mid Range 0.5 to 0.75	Tint, tint + clear low-e, tint + clear IGU tint + clear IGU low-e

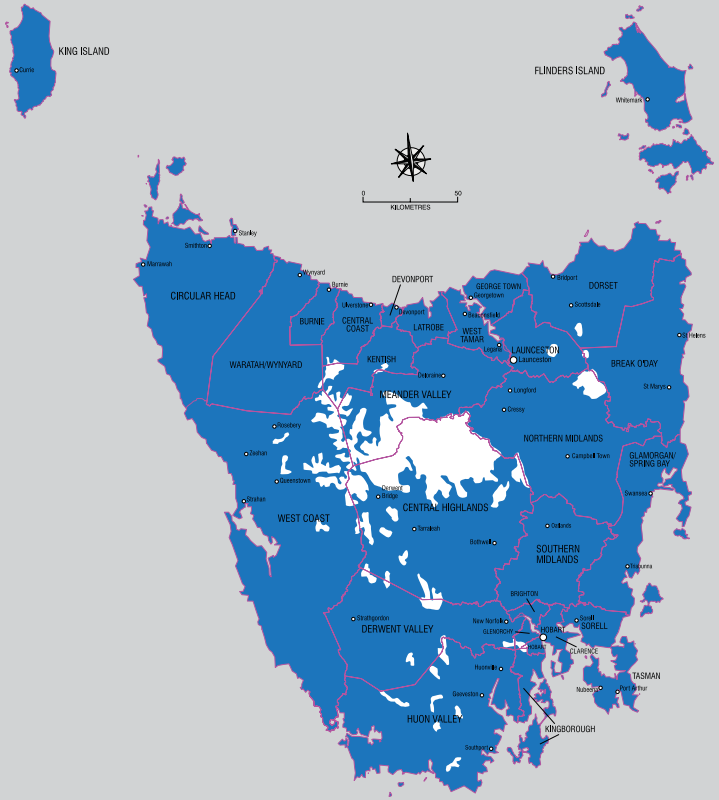
** Dowell suggested thermal performance ranges.*

Cold climate zones 6, 7 & 8

Areas included in these climate zones cover most of Victoria, Australian Capital Territory, Tasmania, and some Southern parts of New South Wales and Western Australia

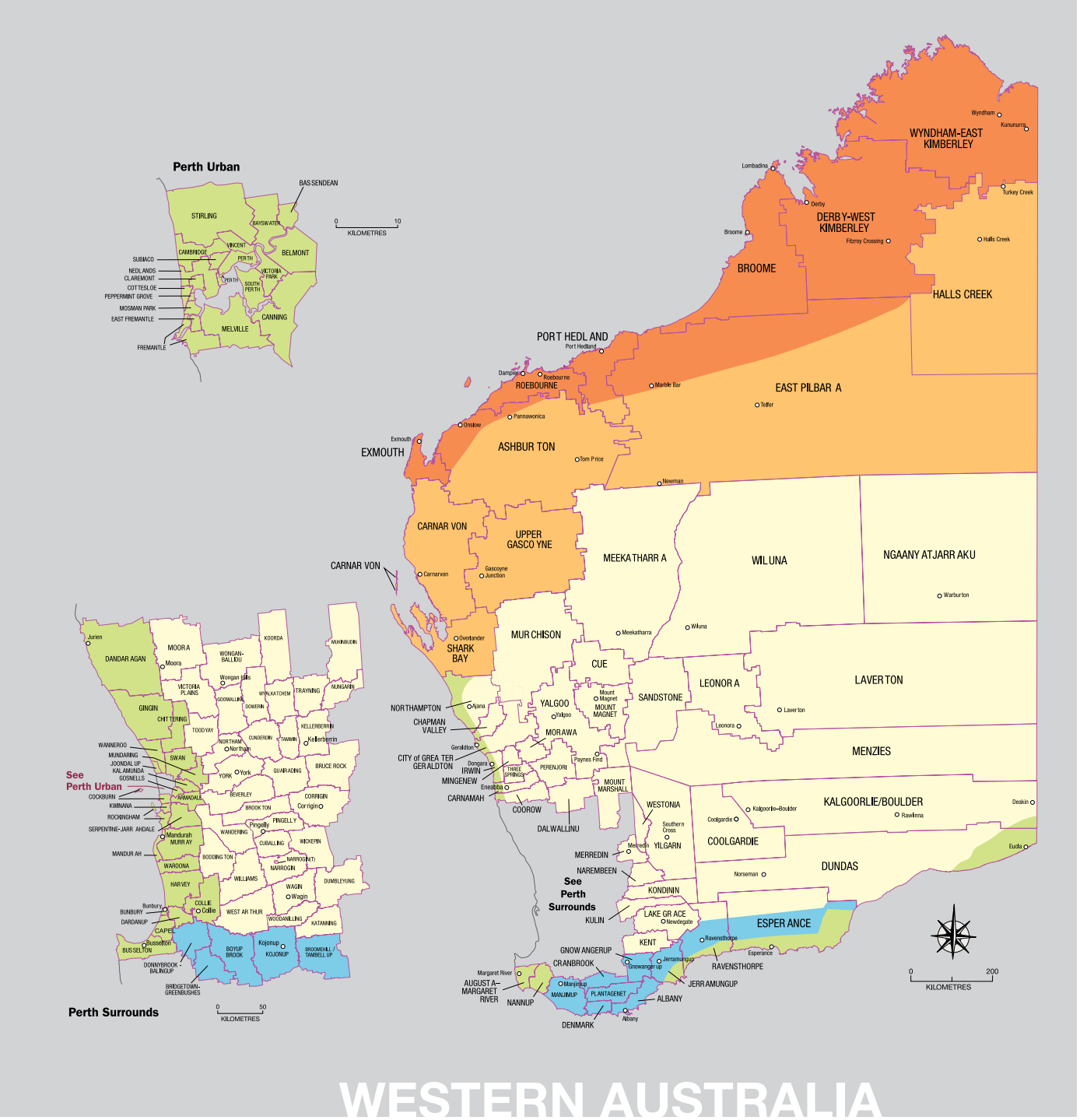
Zone	U_w-value	SHGC	Glazing
6 7 8	*Low 2 to 4.8	*High 0.6 to 0.75	Clear low-e, clear IGU, clear IGU low-e

** Dowell suggested thermal performance ranges.*



TASMANIA

SOUTH AUSTRALIA



WESTERN AUSTRALIA

The following provides a brief description of each National Construction Code (NCC) climate zone:

	Zone	Description
	1	High humidity summer, warm winter
	2	Warm humid summer, mild winter
	3	Hot dry summer, warm winter
	4	Hot dry summer, cool winter
	5	Warm temperate
	6	Mild temperate
	7	Cool temperate
	8	Alpine

Hot climate zones 1, 2 & 3

Areas included in these climate zones are Northern Australia, Brisbane, Darwin

Zone	U_w-value	SHGC	Glazing
1 2 3	*Low 4.5 to 6.5	*Low 0.3 to 0.60	Tinted, tint IGU, high performance tint, tinted low-e (low gain), tint IGU low-e (low gain)

** Dowell suggested thermal performance ranges.*

Mixed climate zones 4 & 5

Areas included in these climate zones are Sydney, Perth and Adelaide

Zone	U_w-value	SHGC	Glazing
4 5	*Low 3.5 to 6.5	*Mid Range 0.5 to 0.75	Tint, tint + clear low-e, tint + clear IGU tint + clear IGU low-e

** Dowell suggested thermal performance ranges.*

Cold climate zones 6, 7 & 8

Areas included in these climate zones cover most of Victoria, Australian Capital Territory, Tasmania, and some Southern parts of New South Wales and Western Australia

Zone	U_w-value	SHGC	Glazing
6 7 8	*Low 2 to 4.8	*High 0.6 to 0.75	Clear low-e, clear IGU, clear IGU low-e

** Dowell suggested thermal performance ranges.*

Dowell **Therma**Line™

PRODUCT SPECIFICATIONS

Dowell awning window
ENERGY PERFORMANCE DATA COMPARISON CHART

Selecting the right energy efficient windows and doors for your home can be a daunting task. To assist you in your decision making process, our energy performance comparison chart, clearly shows the products performance properties, based on Dowells awning window product range.

Please note; There have been instances where window companies quote just the glass U value. This does-not represent the true performance of the window which must include the frame in the calculation of the window U-value. Dowell uses the 'Uw' in describing the performance of its windows in-line with the Australian Standard to assist specifiers and consumers to make informed factually based decisions.

Reference source; Window Energy Rating Scheme, 2014 WERS Certified Products Directory - AFRC (Manufacturer Dowell), [online] Available: http://www.wers.net/werscontent/certified-products-residential (13 November 2014)

PRODUCT	**Awning Single Glazed**	**Awning Double Glazed Window**	**ThermaLine™ Double Glazed Window**	**ThermaLine™ Double Glazed Low E Window**	**ThermaLine™ Sol B Window**
WINDOW TYPE	Awning Window	Awning Window	Awning Window	Awning Window	Awning Window
GLASS OPTION	Single glazing/3mm Clr.	Double glazing/3mm Clr. /12mm/3mm Clr.	Double glazing/4mm Clr. /12mm Arg. gas/4mm Clr.	Double glazing/4mm Clr/12mm Arg. gas /4mm Low E Clr	Double Glazing/4mm SolB. /12mm Arg. gas/4mm Clr.
FRAME TYPE	Standard Aluminium	Standard Aluminium	ThermaLine™ Aluminium (with thermal-break)	ThermaLine™ Aluminium (with thermal-break)	ThermaLine™ Aluminium (with thermal-break)
AIR INFILTRATION	0.07	0.09	0.04	0.04	0.04
HEATING (STARS)	☆★★★ 33%	★★★★★★ 63%	★★★★★★★ 76%	☆★★★★★★★ 82%	★★★★★★ 64%
COOLING (STARS)	★ 20%	☆★★ 39%	★★★ 48%	☆★★★ 53%	☆★★★★★★ 78%
***SHGC**	0.65	0.58	0.52	0.45	0.18
Uw-VALUE	**6.5**	**3.9**	**2.6**	**1.9**	**1.7**

** Solar heat gain co-efficiency*

Dowell ThermaLine™

THERMALLY BROKEN ALUMINIUM WINDOWS AND DOORS

Energy performance product data as rated by WERS.

*Dowell ThermaLine™ are **WERS** rated products.*

The **Window Energy Rating Scheme** (WERS) rates whole of window product energy efficiency performance and is managed by the Australian Window Association (AWA).

WERS is independent of any one manufacturer and acts as a fair, rigorous and credible system for testing performance claims. WERS-rated windows must meet all relevant Australian standards. The scheme forms part of the quality assurance that smart manufacturers offer their customers. It is all about certified performance.

WERS enables windows to be rated and labeled for their annual energy impact on a whole house, in any climate of Australia. A New Zealand variant of WERS, the 'Window Efficiency Rating Scheme', is also available. To participate in WERS, window makers must obtain energy ratings for their products from a rating organisation that is accredited by the Australian Fenestration Rating Council (AFRC).

Reference source; Window Energy Rating Scheme, 2014 WERS Certified Products Directory - AFRC (Manufacturer Dowell), [online] Available: http://www.wers.net/werscontent/certified-products-residential (13 November 2014)

WINDOW TYPE	WINDOW ID	GLAZING ID	COOLING STAR	HEATING STARS	COOL %	HEAT %	UW	SHGC	TVW	AI
DOWELL THERMALLY BROKEN ALUMINIUM AWNING WINDOW - DOUBLE GLAZED - WITH TPS SPACER										
Awning window / DG / TPS	DOW-021-01 (	4Clr/12Ar/4LE	★★★☆	★★★★★★★☆	53%	82%	1.9	0.52	0.54	0.04
Awning window / DG / TPS	DOW-021-02	4Clr/12Ar/4ET	★★★☆	★★★★★★★☆	53%	82%	1.9	0.52	0.54	0.04
Awning window / DG / TPS	DOW-021-03	4SG/12Ar/4ET	★★★★★	★★★★★★☆	68%	70%	1.9	0.31	0.44	0.04
Awning window / DG / TPS	DOW-021-04	4Clr/12Ar/4Clr	★★★	★★★★★★★	48%	76%	2.6	0.55	0.59	0.04
Awning window / DG / TPS	DOW-021-05	4ET/12Ar/4ET	★★★★	★★★★★★★☆	59%	80%	1.8	0.45	0.50	0.04
Awning window / DG / TPS	DOW-021-06	4SolT/12Ar/4ET	★★★★★	★★★★★★☆	68%	72%	1.9	0.32	0.36	0.04
Awning window / DG / TPS	DOW-021-07	4SolB/12Ar/4Clr	★★★★★★☆	★★★★★★	78%	64%	1.7	0.18	0.37	0.04
DOWELL THERMALLY BROKEN ALUMINIUM SLIDING WINDOW - DOUBLE GLAZED - WITH TPS SPACER										
Sliding window / DG / TPS	DOW-022-01	4Clr/12Ar/4ET	★★★	★★★★★★	46%	63%	2.2	0.60	0.63	0.74
Sliding window / DG / TPS	DOW-022-02	4SG/12Ar/4ET	★★★★☆	★★★★★	64%	50%	2.2	0.35	0.51	0.74

Key to ratings table: **GLAZING ID** = Glass Type & Thickness / Space & Gas Fill: **UW** = Whole-window U-value (Uw): **SHGC** = Whole-window solar heat gain coefficient (SHGCw): **TVW** = Whole-window visible transmittance (Tvis): **AI** = Air infiltration rate (L/s.m2) at positive (inward) pressure difference of 75 Pa.

WINDOW TYPE	WINDOW ID	GLAZING ID	COOLING STAR	HEATING STARS	COOL %	HEAT %	UW	SHGC	TVW	AI
Sliding window / DG / TPS	DOW-022-03	4Clr/12Ar/4Clr	★★☆	★★★★★☆	39%	57%	2.9	0.64	0.68	0.74
Sliding window / DG / TPS	DOW-022-04	4ET/12Ar/4ET	★★★☆	★★★★★★	53%	61%	2.0	0.52	0.58	0.74
Sliding window / DG / TPS	DOW-022-05	4SolT/12Ar/4ET	★★★★☆	★★★★★	63%	53%	2.0	0.37	0.42	0.74
Sliding window / DG / TPS	DOW-022-06	4SolB/12Ar/4Clr	★★★★★★	★★★★☆	75%	44%	1.9	0.21	0.43	0.74
DOWELL THERMALLY BROKEN ALUMINIUM FIXED WINDOW - DOUBLE GLAZED - WITH TPS SPACER										
Fixed window / DG / TPS	DOW-023-01	4Clr/12Ar/4ET	★★★	★★★★★★☆	47%	67%	1.8	0.60	0.63	0.04
Fixed window / DG / TPS	DOW-023-02	4SG/12Ar/4ET	★★★★★	★★★★★☆	66%	54%	1.8	0.35	0.51	0.04
Fixed window / DG / TPS	DOW-023-03	4Clr/12Ar/4Clr	★★☆	★★★★★★	40%	61%	2.6	0.64	0.68	0.04
Fixed window / DG / TPS	DOW-023-04	4ET/12Ar/4ET	★★★☆	★★★★★★☆	54%	65%	1.7	0.52	0.59	0.04
Fixed window / DG / TPS	DOW-023-05	4SolT/12Ar/4ET	★★★★★	★★★★★☆	65%	57%	1.7	0.37	0.43	0.04
Fixed window / DG / TPS	DOW-023-06	4SolB/12Ar/4Clr	★★★★★★☆	★★★★★	77%	48%	1.6	0.20	0.43	0.04
DOWELL THERMALLY BROKEN ALUMINIUM FIXED WINDOW - SINGLE GLAZED										
Fixed window / SG	DOW-024-01	4Clr	★	★★★☆	18%	31%	5.4	0.72	0.75	0.04
Fixed window / SG	DOW-024-02	4ET	★★	★★★★★	38%	48%	3.6	0.61	0.70	0.04
Fixed window / SG	DOW-024-03	4SolT	★★★	★★★★	50%	41%	3.6	0.46	0.52	0.04
Fixed window / SG	DOW-024-04	6SP35Gy	★★★☆	★★★★	55%	40%	3.4	0.40	0.34	0.04
Fixed window / SG	DOW-024-05	4SP35Gy	★★★☆	★★★★☆	51%	43%	3.4	0.45	0.42	0.04
DOWELL THERMALLY BROKEN ALUMINIUM SLIDING DOOR - DOUBLE GLAZED										
Sliding door / DG	DOW-025-01	5Clr/12Ar/5ET	★★★	★★★★★★	50%	63%	2.0	0.56	0.60	0.25
Sliding door / DG	DOW-025-02	5SG/12Ar/5ET	★★★★★	★★★★★	68%	50%	2.0	0.31	0.47	0.25
Sliding door / DG	DOW-025-03	5Clr/12Ar/5Clr	★★☆	★★★★★☆	43%	58%	2.7	0.60	0.65	0.25
Sliding door / DG	DOW-025-04	5ET/12Ar/5ET	★★★★	★★★★★★	55%	61%	1.9	0.49	0.55	0.25
Sliding door / DG	DOW-025-05	4SolB/12Ar/4Clr	★★★★★★☆	★★★★☆	77%	45%	1.8	0.19	0.39	0.25
Sliding door / DG	DOW-025-06	4/16Ar/4	★★☆	★★★★★☆	41%	57%	2.9	0.62	0.66	0.25
Sliding door / DG	DOW-025-07	4/16Ar/4ET	★★★	★★★★★★	47%	63%	2.2	0.58	0.61	0.25

Dowell ThermaLine™

WINDOWS

SIZE AND CONFIGURATION



AWNING
WINDOW (N1-N3)

Stud Opening			625	865	1225	1465	1825	2065	2425	2665	
	Bricks		2.5	3.5	5	6	7.5	8.5	10	11	
		Window	610	850	1210	1450	1810	2050	2410	2650	
620	7	600	•	•	•	•	•	•	•	•	
877	10	857	•	•	•	•	•	•	•	•	
1049	12	1029	•	•	•	•	•	•	•	•	
1220	14	1200	•	•	•	•	•	•	•	•	
1392	16	1372	•	•	•	•	•	•	•	•	
1477	17	1457	•	•	•	•	•	•	•	•	
1820	21	1800	•	•	•	•	•	•	•	•	
2096	25	2076	•	•	•	•	•	•	•	•	
2420	28	2400	•	•	•	•	•[2]	•[2]	•[2]	•[2]	

AWNING / FIXED
WINDOW (N1-N3)

1820	21	1800	•	•	•	•	•	•	•	•	*a* 1200 / *b* 600
2096	25	2076	•	•	•	•	•	•	•	•	*a* 1500 / *b* 600
2420	28	2400	•	•	•	•	•[2]	•[2]	•[2]	•[2]	*a* 1800 / *b* 600

Standard sizes and colours are available on short lead times. Some sizes and special colours are subject to longer lead times. Please refer to your local sales office for confirmation.
Key: [2]Not available in N3

OPTION

- Fixed / Awning
- Awning / Awning
- All Awning
- Flyscreens



FIXED
WINDOW (N1-N3)

Stud Opening			625	865	1225	1465	1825	2065	2425	2665	
	Bricks		2.5	3.5	5	6	7.5	8.5	10	11	
		Window	610	850	1210	1450	1810	2050	2410	2650	
620	7	600	•	•	•	•	•	•	•	•	
877	10	857	•	•	•	•	•	•	•	•	
1049	12	1029	•	•	•	•	•	•	•	•	
1220	14	1200	•	•	•	•	•	•	•	•	
1392	16	1372	•	•	•	•	•	•	•	•	
1477	17	1457	•	•	•	•	•	•	•	•	
1820	21	1800	•	•	•	•	•	•	•	•	
2096	25	2076	•	•	•	•	•	•	•	•	
2420	28	2400	•	•	•	•	•	•	•	•	

FIXED / FIXED
WINDOW (N1-N3)

1820	21	1800	•	•	•	•	•	•	•	•	*a* 1200 / *b* 600
2096	25	2076	•	•	•	•	•	•	•	•	*a* 1500 / *b* 600
2420	28	2400	•	•	•	•	•	•	•	•	*a* 1800 / *b* 600

Standard sizes and colours are available on short lead times. Some sizes and special colours are subject to longer lead times. Please refer to your local sales office for confirmation.



SLIDING WINDOW (N1-N3)

Stud Opening			625	865	1225	1465	1825	2065	2065	2425	2425	2665	3025	
	Brick		2.5	3.5	5	6	7.5	8.5	8.5	10	10	11	12.5	
		Window	610	850	1210	1450	1810	2050	2050	2410	2410	2650	3010	
620	7	600	•	•	•	•	•	•	•	•	•	•	•	
877	10	857	•	•	•	•	•	•	•	•	•	•	•	
1049	12	1029	•	•	•	•	•	•	•	•	•	•	•	
1220	14	1200	•	•	•	•	•	•	•	•	•	•	•	
1392	16	1372	•	•	•	•	•	•	•	•	•	•	•	
1477	17	1457	•	•	•	•	•	•	•	•	•	•	•	
1820	21	1800	•	•	•	•	•	•	•	•	•	•	•	
2096	25	2076	•	•	•	•	•	•	•	•	•	•	•	
2420	28	2400	•	•	•	•	•	•	•	•	•	•	•	

SLIDING / FIXED WINDOW (N1-N3)

1820	21	1800	•	•	•	•	•	•	•	•	•	•	•	a 1200 / b 600
2096	25	2076	•	•	•	•	•	•	•	•	•	-	-	a 1500 / b 600
2420	28	2400	•	•	•	•	•	•	•	•	•	-	-	a 1800 / b 600

OPTION

Reverse Sash

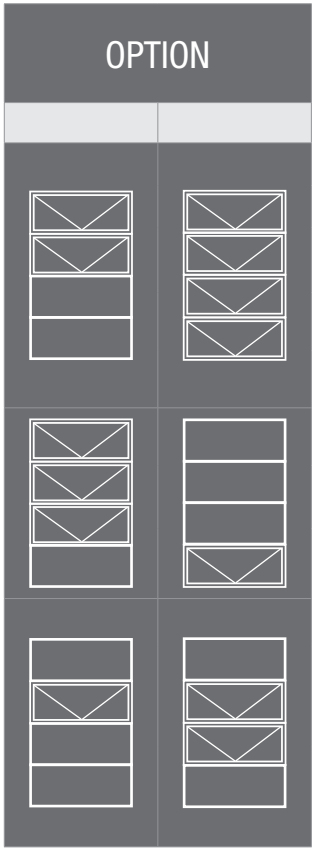
Flyscreens

Standard sizes and colours are available on short lead times. Some sizes and special colours are subject to longer lead times. Please refer to your local sales office for confirmation.



MULTI-TRANSOM
AWNING WINDOW (N1-N3)

Stud Opening			625	865	1225	1465	1825	2065	2425	
	Bricks		2.5	3.5	5	6	7.5	8.5	10	
		Window	610	850	1210	1450	1810	2050	2410	
620	7	600	•	•	•	•	•	•	•	
877	10	857	•	•	•	•	•	•	•	
1049	12	1029	•	•	•	•	•	•	•	
1220	14	1200	•	•	•	•	•	•	•	
1392	16	1372	•	•	•	•	•	•	•	
1477	17	1457	•	•	•	•	•	•	•	
1820	21	1800	•	•	•	•	•	•	•	
2096	25	2076	•	•	•	•	•	•	•	
2420	28	2400	•	•	•	•	•	•	•	



Standard sizes and colours are available on short lead times. Some sizes and special colours are subject to longer lead times. Please refer to your local sales office for confirmation.

Dowell **Therma**Line™

SLIDING DOOR

SIZE AND CONFIGURATION

Dowell ThermaLine™
SLIDING DOOR

Dowell ThermaLine™ sliding doors meet the highest requirements in terms of thermal insulation and structural construction.

Dowell ThermaLine™ sliding doors offer a high level of comfort in your home by maintaining a constant, agreeable room climate, saving valuable energy and reducing high energy costs. Regardless of your climate zone, Dowell ThermaLine™ sliding doors, not only provide optimal energy efficiency on cold days, but also in summer by keeping the heat outside and reducing the need for air-conditioning. Now, your energy consumption does not need to increase exponentially - either in summer or winter.

Dowell ThermaLine™ sliding door are ideal for large-scale openings - demanding maximum transparency. Our 2400 mm (h) aluminium sliding doors, create rooms flooded with light and invite attractive views as well as giving design emphases to your home. Quiet and robust rollers provide years of trouble free smooth and easy operation. Optimum sound insulation can also be achieved, with selective glazing over 30db of outside noise can be eliminated.

What makes the Dowell ThermaLine™ sliding door stand out is its wide profile face widths and in-line construction. The elegant design allows new room concepts with an improved standard of living to be created. Dowell ThermaLine™ range is compatible with one another, resulting in an harmonious overall appearance of all your windows, and sliding door.

Dowell ThermaLine™ sliding doors have excellent insulation, offer high level of comfort, maintain low energy costs and emphasise a modern look.



SLIDING DOORS (N1-N3)

Stud Opening		1510	1870	2110	2470	2784	3144	3684	2950	3670	4150	4870
	Door	1450	1810	2050	2410	2724	3084	3624	2890	3610	4090	4810
2140	2100	•	•	•	•	•	•	•	•	•	•	•

OPTION

Reverse Hand

Barrier Grille Screen

Colonial C1

Screen Door

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Dowell ThermaLine™
IT'S AUSTRALIAN

Dowell has a long proud history in the fabrication and supply of windows and doors to the Australian residential housing market dating back to 1860.

With the recognition of aluminium as a manufacturing material in the post war era, Dowell was the first company to develop the technology to use aluminium in the fabrication of windows in Australia.

Today Dowell is a leading supplier of aluminium windows and doors to the residential housing market throughout Australia.

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DOWELL

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