NATIONWIDE HOUSE ENERGY RATING SCHEME

A GUIDE TO WINDOWS IN NATHERS SOFTWARE

Factsheet

This fact sheet explains how windows impact on a home's energy performance and the different types that can be used in Nationwide House Energy Rating Scheme (NatHERS) assessments.

Window Performance

Windows alter the energy efficiency of a home's design through two heat transfer mechanisms: conduction and solar heat gain.

Conduction is expressed as a 'U-value' and is a measure of the rate that non-solar heat is lost or gained through the window unit. The lower the U-value, the greater a window's resistance to heat flow and the better its ability to insulate.

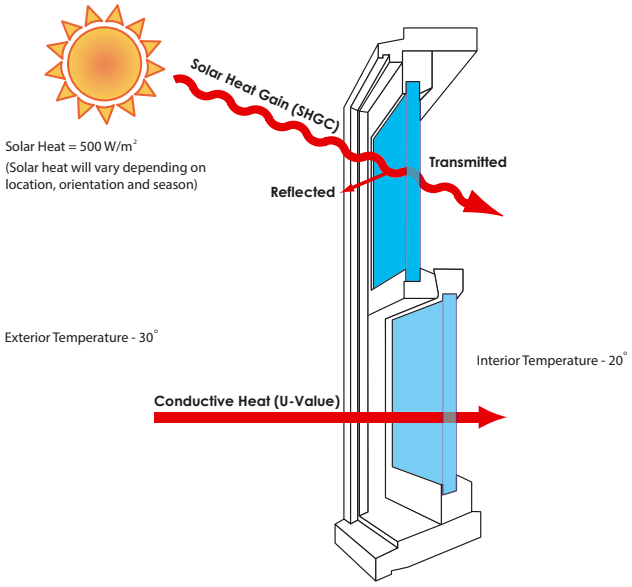
Solar heat gain coefficient (SHGC) is a measure of how readily heat from direct sunlight flows through a window system. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.

Types of glass

There are four categories of glass in NatHERS software tools:

- Clear glass.
- Tinted glass: This glass is best used to reduce solar heat gain in hot climates.
- High-solar-transmittance/gain (low-e) glass: This glass is normally used in cool climates. The high solar transmittance means it will allow solar heat gain through in winter and the low-e reduces heat loss from the interior.
- Low-solar-transmittance/gain (low-e) glass: This glass is normally used in hot climates. The low solar transmittance means that it will reduce solar heat gain through in summer and the low-e reduces heat gain into the interior.

Figure 2



Source: Australian Window Association

Double and triple glazing

Double and triple glazing (also sometimes referred to as insulated glass units (IGUs)) are made from multiple panes of glass. The panes may be the same or different types of glass. The gaps between panes may be filled with air, argon or krypton gas. The performance of double glazing is improved when the air fill is replaced with argon. Argon is a denser gas and is used to reduce heat loss in IGUs by slowing down convection inside the air space. It works efficiently with low-e glazing.

Types of NatHERS Windows

In NatHERS software tools there are two different groups of windows available for use to establish a rating:

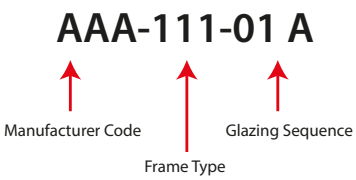
1. **Custom Windows:** The custom windows 'library' consists of windows that are actual windows available on the market in Australia. This library is managed and provided to NatHERS software tool developers by the Australian Fenestration Rating Council (AFRC), who have been tested and approved the windows using AFRC protocols. If a custom window is used in a NatHERS assessment, it will be displayed on the Universal Certificate and can be checked off for compliance.
2. **Default Windows:** Default windows are a group of statistically-derived windows that can be used when full information about the windows that will be used in the home are not available at the time of rating. If a default window is used in a NatHERS assessment, an allowable tolerance for the U-value and SHGC value will be shown on the Universal Certificate and the final window product will need to conform within that range to be compliant.

Custom Windows

There are over 10,000 custom windows in NatHERS software tools. Each custom window is a unique product with specific performance values for the frame material, operating type and glazing. Access to the custom windows library gained by successfully completing an approved course or training.

Each custom window consists of a 9 digit alpha-numeric code, comprising:

- the manufacturer's three letter abbreviated name
- three numerals for the frame type
- two numerals for the glazing type sequence number
- one letter for the frame material code.



Each code is unique to the frame, operating type, glazing and manufacturer.

Please note that this code is for NatHERS software tool identification only and is not a code used to order windows from a builder or window supplier.

Default Windows

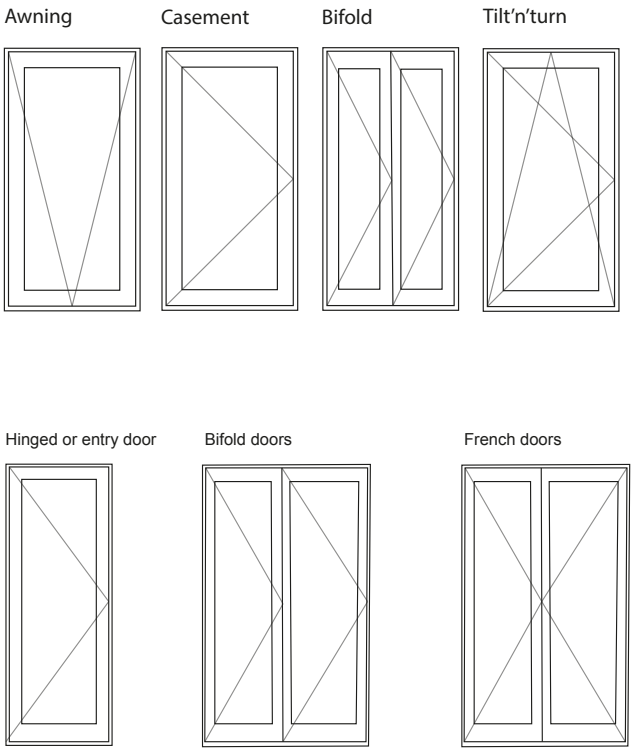
There are 136 default windows to choose from in the NatHERS software, comprising six frame types and 12 glazing types. The full list is provided in Table 1. The default windows were developed by analysing the windows in the AFRC database for frame types, glazing combinations and window or door operating type, to generate a selection of representative windows.

Default window groups

Default windows are divided into two groups (A and B), which represent window operating type and style. These groups are important because windows in group A have different frame fractions (the proportion of frame to glass in a window) than windows in group B. For each default window, representative performance values (U and SHGC) were created and are listed in Table 1.

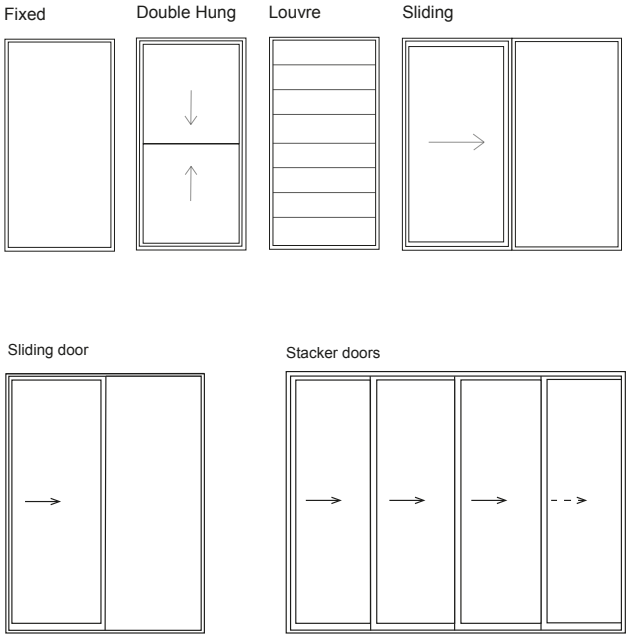
- **Group A** is for windows and doors with a larger frame fraction including: awning windows; bifold windows and doors; casement windows; tilt'n'turn windows; entry doors; french doors; and hinged doors. **(Figure 2)**

Figure 2



- **Group B** is for windows and doors with a smaller frame fraction including: fixed windows; double hung windows; louvre windows; sliding windows and doors; and stacker doors. **(Figure 3)**

Figure 3



Default window codes

Default window codes are built in to NatHERS software. Each default window has a code consisting of three letters, five digits and an additional letter.

Please note that this code is for NatHERS software tool identification only and is not a code used to order windows from a builder or window supplier.

The first three letters of the window code represent the material of the default window:

ALM → aluminium

ATB → aluminium thermally broken

CMP → composite

TIM → timber

uPVC → unplasticised polyvinyl chloride

FIB → fibreglass

The next three digits of the window code represents the group the default window is assigned to, the type of glazing (single or double glazing) and the type of air gap (air or argon):

001 → Group A single glazing

002 → Group B single glazing

003 → Group A double glazing with air fill

004 → Group B double glazing with air fill

005 → Group A double glazing with argon fill

006 → Group B double glazing with argon fill

The last two digits indicate the coating of the glass:

01 → clear

02 → tint

03 → high solar gain low-E (HSG low-e)

04 → low solar gain low-E (LSG low-e)

The last letter is used by the NatHERS software tool when calculating the frame material in the rating simulation process.

A → aluminium frame with no thermal break

B → aluminium frame with thermal break

I → composite frame

W → uPVC, timber or fibreglass frame

For example, a window with an aluminium frame and Group A single clear glazing would have a code of ALM-001-01-A, and a timber awning window with double glazing and argon fill with high solar low-e would have a code of TIM-005-03-W.

The following table lists all the current default windows.

Table 1 Listing of all current default windows							
Type		**Code**	**Frame**		**Glazing**	**Uw**	**SHGCw**
Aluminium	Aluminium Group A single glazing	ALM-001-01 A	Aluminium A		Clear	6.7	0.57
		ALM-001-02 A	Aluminium A		Tint	6.6	0.41
		ALM-001-03 A	Aluminium A		HSG low-e	5.4	0.49
		ALM-001-04 A	Aluminium A		LSG low-e	5.6	0.36
	Aluminium Group B single glazing	ALM-002-01 A	Aluminium B		Clear	6.7	0.7
		ALM-002-02 A	Aluminium B		Tint	6.6	0.49
		ALM-002-03 A	Aluminium B		HSG low-e	5.4	0.58
		ALM-002-04 A	Aluminium B		LSG low-e	5.6	0.41
	Aluminium Group A double glazing air fill	ALM-003-01 A	Aluminium A	DG	Clear/air fill/clear	4.8	0.51
		ALM-003-02 A	Aluminium A	DG	Tint/air fill/clear	5.2	0.35
		ALM-003-03 A	Aluminium A	DG	HSG low-e/air fill/clear	4.3	0.47
		ALM-003-04 A	Aluminium A	DG	LSG low-e/air fill/clear	4.9	0.33
	Aluminium Group B double glazing air fill	ALM-004-01 A	Aluminium B	DG	Clear/air fill/clear	4.8	0.59
		ALM-004-02 A	Aluminium B	DG	Tint/air fill/clear	5.2	0.39
		ALM-004-03 A	Aluminium B	DG	HSG low-e/air fill/clear	4.3	0.53
		ALM-004-04 A	Aluminium B	DG	LSG low-e/air fill/clear	4.9	0.33
	Aluminium Group A double glazing argon fill	ALM-005-01 A	Aluminium A	DG	Clear/argon fill/clear	4.5	0.5
		ALM-005-02 A	Aluminium A	DG	Tint/argon fill/clear	5.1	0.32
		ALM-005-03 A	Aluminium A	DG	HSG low-e/argon fill/clear	4.1	0.47
		ALM-005-04 A	Aluminium A	DG	LSG low-e/argon fill/clear	4.8	0.34
	Aluminium Group B double glazing argon fill	ALM-006-01 A	Aluminium B	DG	Clear/argon fill/clear	4.5	0.61
		ALM-006-02 A	Aluminium B	DG	Tint/argon fill/clear	5.1	0.36
		ALM-006-03 A	Aluminium B	DG	HSG low-e/argon fill/clear	4.1	0.52
		ALM-006-04 A	Aluminium B	DG	LSG low-e/argon fill/clear	4.8	0.34
Aluminium thermally broken	Aluminium thermally broken Group A double glazing air fill	ATB-003-01 B	Aluminium TB A	DG	Clear/air fill/clear	3.6	0.47
		ATB-003-02 B	Aluminium TB A	DG	Tint/air fill/clear	3.6	0.23
		ATB-003-03 B	Aluminium TB A	DG	HSG low-e/air fill/clear	3.1	0.39
		ATB-003-04 B	Aluminium TB A	DG	LSG low-e/air fill/clear	3.1	0.27
	Aluminium thermally broken Group B double glazing air fill	ATB-004-01 B	Aluminium TB B	DG	Clear/air fill/clear	3.6	0.54
		ATB-004-02 B	Aluminium TB B	DG	Tint/air fill/clear	3.6	0.3
		ATB-004-03 B	Aluminium TB B	DG	HSG low-e/air fill/clear	3.1	0.49
		ATB-004-04 B	Aluminium TB B	DG	LSG low-e/air fill/clear	3.1	0.27
	Aluminium thermally broken Group A double glazing argon fill	ATB-005-01 B	Aluminium TB A	DG	Clear/argon fill/clear	3.5	0.47
		ATB-005-02 B	Aluminium TB A	DG	Tint/argon fill/clear	3.4	0.32
		ATB-005-03 B	Aluminium TB A	DG	HSG low-e/argon fill/clear	2.9	0.44
		ATB-005-04 B	Aluminium TB A	DG	LSG low-e/argon fill/clear	3	0.27
	Aluminium thermally broken Group B double glazing argon fill	ATB-006-01 B	Aluminium TB B	DG	Clear/argon fill/clear	3.5	0.64
		ATB-006-02 B	Aluminium TB B	DG	Tint/argon fill/clear	3.4	0.4
		ATB-006-03 B	Aluminium TB B	DG	HSG low-e/argon fill/clear	2.9	0.51
		ATB-006-04 B	Aluminium TB B	DG	LSG low e/argon fill/clear	3	0.26

Composite	Composite Group A single glazing	CMP-001-01 I	Composite A		Clear	5.9	0.57
		CMP-001-02 I	Composite A		Tint	6.2	0.41
		CMP-001-03 I	Composite A		HSG low-e	4.6	0.36
		CMP-001-04 I	Composite A		LSG low-e	4.6	0.36
	Composite Group B single glazing	CMP-002-01 I	Composite B		Clear	5.9	0.65
		CMP-002-02 I	Composite B		Tint	6.2	0.45
		CMP-002-03 I	Composite B		HSG low-e	3.7	0.61
		CMP-002-04 I	Composite B		LSG low-e	4.6	0.46
	Composite Group A double glazing air fill	CMP-003-01 I	Composite A	DG	Clear/air fill/clear	3.9	0.51
		CMP-003-02 I	Composite A	DG	Tint/air fill/clear	3.9	0.32
		CMP-003-03 I	Composite A	DG	HSG low-e/air fill/clear	3.4	0.47
		CMP-003-04 I	Composite A	DG	LSG low-e/air fill/clear	3.4	0.32
	Composite Group B double glazing air fill	CMP-004-01 I	Composite B	DG	Clear/air fill/clear	3.9	0.59
		CMP-004-02 I	Composite B	DG	Tint/air fill/clear	3.9	0.37
		CMP-004-03 I	Composite B	DG	HSG low-e/air fill/clear	3.4	0.53
		CMP-004-04 I	Composite B	DG	LSG low-e/air fill/clear	3.4	0.33
	Composite Group A double glazing argon fill	CMP-005-01 I	Composite A	DG	Clear/argon fill/clear	3.9	0.5
		CMP-005-02 I	Composite A	DG	Tint/argon fill/clear	3.9	0.33
		CMP-005-03 I	Composite A	DG	HSG low-e/argon fill/clear	3.2	0.46
		CMP-005-04 I	Composite A	DG	LSG low-e/argon fill/clear	2.2	0.32
	Composite Group B double glazing argon fill	CMP-006-01 I	Composite B	DG	Clear/argon fill/clear	3.9	0.63
		CMP-006-02 I	Composite B	DG	Tint/argon fill/clear	3.9	0.4
		CMP-006-03 I	Composite B	DG	HSG low-e/argon fill/clear	3.2	0.49
		CMP-006-04 I	Composite B	DG	LSG low-e/argon fill/clear	2.2	0.39
Fibreglass	Fibreglass Group A single glazing	FIB-001-01 W	Fibreglass A		Clear	5.4	0.56
		FIB-001-02 W	Fibreglass A		Tint	5.4	0.41
		FIB-001-03 W	Fibreglass A		HSG low-e	4.3	0.42
		FIB-001-04 W	Fibreglass A		LSG low-e	3.7	0.35
	Fibreglass Group B single glazing	FIW-002-01 W	Fibreglass B		Clear	5.4	0.63
		FIW-002-02 W	Fibreglass B		Tint	5.4	0.49
		FIW-002-03 W	Fibreglass B		HSG low-e	4.3	0.5
		FIW-002-04 W	Fibreglass B		LSG low-e	3.7	0.38
	Fibreglass Group A double glazing air fill	FIB-003-01 W	Fibreglass A	DG	Clear/air fill/clear	3	0.48
		FIB-003-02 W	Fibreglass A	DG	Tint/air fill/clear	2.9	0.33
		FIB-003-03 W	Fibreglass A	DG	HSG low-e/air fill/clear	2.3	0.26
		FIB-003-04 W	Fibreglass A	DG	LSG low-e/air fill/clear	2.3	0.19
	Fibreglass Group B double glazing air fill	FIB-004-01 W	Fibreglass B	DG	Clear/air fill/Clear	3	0.56
		FIB-004-02 W	Fibreglass B	DG	Tint/air fill/Clear	2.9	0.42
		FIB-004-03 W	Fibreglass B	DG	HSG low-e/air fill/clear	2.3	0.32
		FIB-004-04 W	Fibreglass B	DG	LSG low-e/air fill/clear	2.3	0.25
	Fibreglass Group A double glazing argon fill	FIB-005-01 W	Fibreglass A	DG	Clear/argon fill/clear	2.6	0.5
		FIB-005-02 W	Fibreglass A	DG	Tint/argon fill/clear	2.5	0.25
		FIB-005-03 W	Fibreglass A	DG	HSG low-e/argon fill/clear	2	0.25
		FIB-005-04 W	Fibreglass A	DG	LSG low-e/argon fill/clear	2	0.18
	Fibreglass Group B double glazing argon fill	FIW-006-01 W	Fibreglass B	DG	Clear/argon fill/clear	2.6	0.53
		FIW-006-02 W	Fibreglass B	DG	Tint/argon fill/clear	2.5	0.28
		FIW-006-03 W	Fibreglass B	DG	HSG low-e/argon fill/clear	2	0.31
		FIW-006-04 W	Fibreglass B	DG	LSG low-e/argon fill/clear	2	0.23

uPVC	uPVC Group A single glazing	PVC-001-01 W	uPVC A		Clear	5.4	0.56
		PVC-001-02 W	uPVC A		Tint	5.4	0.41
		PVC-001-03 W	uPVC A		HSG low-e	4.3	0.42
		PVC-001-04 W	uPVC A		LSG low-e	3.7	0.35
	uPVC Group B single glazing	PVC-002-01 W	uPVC B		Clear	5.4	0.63
		PVC-002-02 W	uPVC B		Tint	5.4	0.49
		PVC-002-03 W	uPVC B		HSG low-e	4.3	0.5
		PVC-002-04 W	uPVC B		LSG low-e	3.7	0.38
	uPVC Group A double glazing air fill	PVC-003-01 W	uPVC A	DG	Clear/air fill/clear	3	0.48
		PVC-003-02 W	uPVC A	DG	Tint/air fill/clear	2.9	0.33
		PVC-003-03 W	uPVC A	DG	HSG low-e/air fill/clear	2.3	0.26
		PVC-003-04 W	uPVC A	DG	LSG low-e/air fill/clear	2.3	0.19
	uPVC Group B double glazing air fill	PVC-004-01 W	uPVC B	DG	Clear/air fill/clear	3	0.56
		PVC-004-02 W	uPVC B	DG	Tint/air fill/clear	2.9	0.42
		PVC-004-03 W	uPVC B	DG	HSG low-e/air fill/clear	2.3	0.32
		PVC-004-04 W	uPVC B	DG	LSG low-e/air fill/clear	2.3	0.25
	uPVC Group A double glazing argon fill	PVC-005-01 W	uPVC A	DG	Clear/argon fill/clear	2.6	0.5
		PVC-005-02 W	uPVC A	DG	Tint/argon fill/clear	2.5	0.25
		PVC-005-03 W	uPVC A	DG	HSG low-e/argon fill/clear	2	0.25
		PVC-005-04 W	uPVC A	DG	LSG low-e/argon fill/clear	2	0.18
	uPVC Group B double glazing argon fill	PVC-006-01 W	uPVC B	DG	Clear/argon fill/clear	2.6	0.53
		PVC-006-02 W	uPVC B	DG	Tint/argon fill/clear	2.5	0.28
		PVC-006-03 W	uPVC B	DG	HSG low-e/argon fill/clear	2	0.31
		PVC-006-04 W	uPVC B	DG	LSG low-e/argon fill/clear	2	0.23
Timber	Timber Group A single glazing	TIM-001-01 W	Timber A		Clear	5.4	0.56
		TIM-001-02 W	Timber A		Tint	5.4	0.41
		TIM-001-03 W	Timber A		HSG low-e	4.3	0.42
		TIM-001-04 W	Timber A		LSG low-e	3.7	0.35
	Timber Group B single glazing	TIM-002-01 W	Timber B		Clear	5.4	0.63
		TIM-002-02 W	Timber B		Tint	5.4	0.49
		TIM-002-03 W	Timber B		HSG low-e	4.3	0.5
		TIM-002-04 W	Timber B		LSG low-e	3.7	0.38
	Timber Group A double glazing air fill	TIM-003-01 W	Timber A	DG	Clear/air fill/clear	3	0.48
		TIM-003-02 W	Timber A	DG	Tint/air fill/clear	2.9	0.33
		TIM-003-03 W	Timber A	DG	HSG low-e/air fill/clear	2.3	0.26
		TIM-003-04 W	Timber A	DG	LSG low-e/air fill/clear	2.3	0.19
	Timber Group B double glazing air fill	TIM-004-01-W	Timber B	DG	Clear/air fill/clear	3	0.56
		TIM-004-02 W	Timber B	DG	Tint/air fill/clear	2.9	0.42
		TIM-004-03 W	Timber B	DG	HSG low-e/air fill/clear	2.3	0.32
		TIM-004-04 W	Timber B	DG	LSG low-e/air fill/clear	2.3	0.25
	Timber Group A double glazing argon fill	TIM-005-01 W	Timber A	DG	Clear/argon fill/clear	2.6	0.5
		TIM-005-02 W	Timber A	DG	Tint/argon fill/clear	2.5	0.25
		TIM-005-03 W	Timber A	DG	HSG low-e/argon fill/clear	2	0.25
		TIM-005-04 W	Timber A	DG	LSG low-e/argon fill/clear	2	0.18
	Timber Group B double glazing argon fill	TIM-006-01 W	Timber B	DG	Clear/argon fill/clear	2.6	0.53
		TIM-006-02 W	Timber B	DG	Tint/argon fill/clear	2.5	0.28
		TIM-006-03 W	Timber B	DG	HSG low-e/argon fill/clear	2	0.31
		TIM-006-04 W	Timber B	DG	LSG low-e/argon fill/clear	2	0.23