Performance

The **Wood Window** Alliance

WOOD. AT THE HEART
OF A GOOD WINDOW

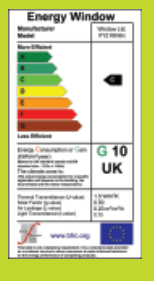
Performance

Windows made by Wood Window Alliance members are able to meet the following criteria:

- U-values as low as 1.0W/m²K
- WER ratings as high as A
- Weather performance to BS 6375 part 1 and 2
- Excellent acoustic performance
- Secured by Design

The Window Energy Rating (WER) – a way of showing a window's energy rating in a similar way to white goods etc, uses a combination of three factors:

1. Thermal transmittance of the window frame and glass unit
2. Air leakage of the window
3. Solar gain factor



Thermal performance

- Energy efficient windows are a Building Regulations requirement – (Approved Document L or Part L) for all buildings, with the exception of listed buildings
- All windows carrying the Wood Window Alliance quality mark come double or triple-glazed, and are effectively designed and sealed to be weather-proof
- Because of timber's inherent strength, triple-glazing is more practical and cost-effective with wood windows than with other materials
- The most efficient size of glass-to-air gap to produce a double glazing unit (IGU) is 4mm glass – 16mm air gap – 4 mm glass, thus forming a 24mm IGU (4-16-4)
- Overall U-values of IGUs can be improved further by altering the internal and external transfer of heat by conduction, convection and radiation of the glass and the gas medium (air):
  - Conducted and convected heat, by replacing the air with a gas with lower thermal conductivity (argon or krypton)
  - Radiated heat, by using glass with a low-emissivity coating (Low-E glass)

Glazing unit	Thermal conductivity W/m²K
Single glass	5.8
Standard double glazing (4-16-4)	2.7
Double glazing with Low E glass – air filled	1.3
Double glazing with Low E glass – argon filled	1.1
Double glazing with low E glass – krypton filled	1.0
Triple glazed units	<1.0

Simulated U-values for the whole window will differ from the above because they take the frame dimensions into account.

Frame material	Thermal conductivity W/m²K
Softwood	0.13
Hardwood	0.18
Rigid PVC	0.17
Aluminium	160.0
Steel	50
GRP	0.40

ISO 10077 – 2 : 2003: Thermal Performance of windows, doors and shutters. Calculation of thermal transmittance.

- WER is not the only way of assessing the energy efficiency of a window
- There is little or no difference between the thermal performance of wood and PVC-U windows when each are glazed with the same double glazing units
- In assessing the thermal performance of windows, the weather performance, or weather tightness, of the window should always be considered in addition to the U-value of the glass units
- Wood windows can be manufactured using IGUs with a variety of U-values to suit the specifier's or client's requirements
- Centre pane values – the U-value of the IGU only – help in establishing the starting point for assessing the overall U-value of the window. Other factors, such as the efficiency of the frame spacer-bar material and seals, should also be considered
- Establishing a high solar gain from the window requires a reduction in frame section and may affect the aesthetic appearance of the window
- Specifiers can decide to compromise on the U-value in favour of the aesthetic appearance of the window, or to maximise solar gain while compromising on the aesthetic appearance.

Weather performance

A window's ability to combat all aspects of the weather is essential and increasingly important as climate change leads to stronger winds and more extreme rainfall.

- There are performance standards for basic weather and mechanical performance of all types of window, whatever the frame material
- In the UK the standard for this performance is BS 6375, which is divided into Part 1 for basic weather resistance and Part 2 for the window's operation and strength characteristics
- Weather performance test evidence relevant to the window type should be requested by the client or specifier before making a final selection
- It is important to ensure that the client understands how the type of window selected will perform
- Check that any test evidence is verified by a third party accreditation body. This is particularly important when small, local manufacturers are involved in the supply process.

The Wood Window Alliance quality mark demonstrates that the window has third party weather performance accreditation.

Acoustic performance

- The current Building Regulations Approved Document E, Resistance to the Passage of Sound, demands that the issue of noise is addressed in the construction of new homes and the refurbishment of existing properties
- Acoustic performance is now an important part of planning and building design. Residents are also more aware of the problems of noise and less tolerant of noise pollution
- Single-glazing and even standard doubled-glazed units are not good sound insulators. Further improvements can be achieved by the use of thicker glass in the IGUs or more specialised glass
- For extreme situations, triple-glazing or the use of 'double windows', where a second glazed window or secondary glazing is introduced, should be considered
- It is important to specify the amount of sound reduction required and state the relevant frequency level. A sound engineer can help in determining the type of window required.

Security performance

- Most insurance companies demand ground floor window locks as a standard requirement
- Secure wood windows are available to meet all requirements
- Laminated glass can be used to enhance the security of ground floor windows and those adjacent to entrance doors
- Members of the Wood Window Alliance offer windows which comply with BS: 7950: 1997 specification for enhanced security performance of casement and tilt/turn windows for domestic applications
- Although this standard does not include certain window types, such as vertical sliding sash or fully reversible windows, these types have also been shown to meet the criteria required by the test.

Secured by Design

- Secured by Design (SBD) is the UK police initiative supporting the principles of designing out crime through effective crime prevention and security standards for a range of applications. It is managed by ACPO, the Association of Chief Police Officers
- The Secured by Design scheme functions on two levels:
  - An award to developers who build developments to Secured by Design standards
  - A licensing scheme for products which meet police preferred specifications
- In order to achieve Secured by Design license status, wood windows must comply to the standard BS 644, or the BWF Timber Window Accreditation Scheme and have 3rd part accreditation to demonstrate compliance with BS 7950 : 1997.