SAINT-GOBAIN GLASS

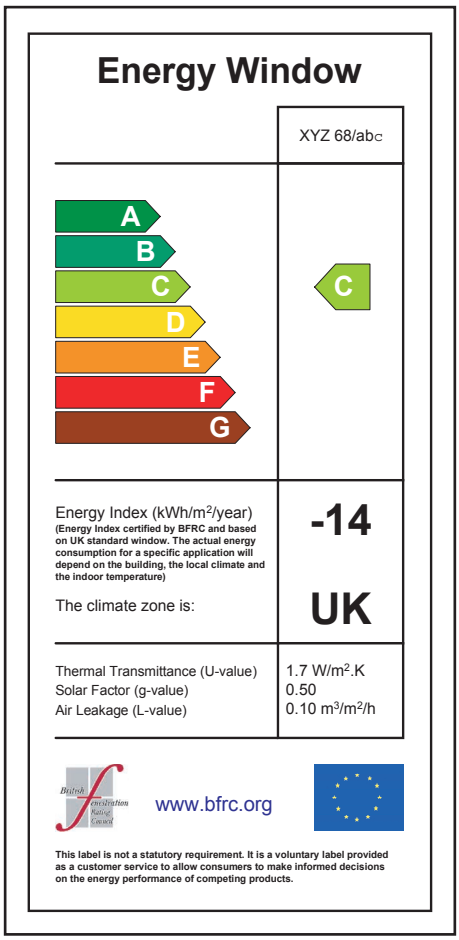
Technical Datasheet

A summary of Window Energy Ratings

SGG PLANITHERM TOTAL combines excellent thermal insulation with high solar heat gain, making it one of the most energy efficient products available for WERs.

Introduction

Part L of the Building Regulations for England and Wales (and Part F in Northern Ireland) includes Window Energy Ratings (WER) as an alternative method of compliance. The minimum level for replacement domestic windows is band E. For windows in new domestic extensions, the minimum requirement is band D. Additionally, in new dwellings, BFRC Ratings are now being used to guide building professionals towards more energy efficient design and building components.



What is a Window Energy Rating?

Window Energy Ratings were launched in early 2004 by the British Fenestration Rating Council (BFRC), an independent organisation dedicated to improving the energy efficiency of fenestration products. In late 2006 the BFRC became part of the Glass and Glazing Federation to ensure that appropriate management systems and organisation were developed to cope with increasing demand for window ratings.

A window's rating is determined by a formula which takes into account available solar heat gains (window g-value) and subtracts the thermal losses (window U-value and air leakage).

- WERs = Solar Gains - (Thermal Losses + Air Leakage)
- WERs = 218.6 x g window - 68.5 x (U window + L_{50})

The resulting numerical value (Energy Index) is generally a negative number which is then placed into a band on an A-G scale consistent with other energy performance labels already familiar to the consumer.

BFRC Rating Scale	BFRC Rating (kWh/m²/year)
A	0 or greater
B	-10 to < 0
C	-20 to < -10
D	-30 to < -20
E	-50 to < -30
F	-70 to < -50
G	Less than -70

The A-G rating system provides a means of promoting energy-efficient windows to the consumer and may help the government incentivise their uptake.

- Already, windows with a C rating or higher are endorsed by the Energy Saving Trust's 'Energy efficiency recommended' scheme and may carry the EER logo (www.est.org.uk).

- The EST has also produced a series of Best Practice guides for windows in new dwellings which use BFRC ratings as the measure of window performance; Good Practice is achieved with D rated windows and Best Practice with C rated windows. Whilst not mandatory, these guides will be used increasingly in any government-funded construction (e.g. social housing).
- C rated windows are also included on DEFRA's 'illustrative list of possible energy efficiency measures' as part of the Energy Efficiency Commitment (EEC) paving the way for possible future subsidies (www.defra.gov.uk).

How are windows rated?

A BFRC rating and label applies to the combined performance of all the components that make up a window rather than any individual element. Therefore it would usually be the final product supplied by a window installer or window fabricator (when factory-glazed) that is rated and labelled.

Obtaining a BFRC Rating and label involves the following steps:

1. Select a BFRC certified simulator to produce an assessment report of the chosen window. The simulator will usually require:
   - details of the frame design (using a standard GGF configuration)
   - the g-value and emissivity of the glazing
   - the L-value (air leakage) of the window through testing to BS 6375.

   The whole window U-value and energy index is then calculated using approved software.
2. Select an Independent Agency to verify the results of the simulator's report and the presence and operation of a suitable quality management system.
3. Following successful verification the Independent Agency will release the results to the BFRC on request of the customer. On receipt of payment of the BFRC fees the products will be listed on the BFRC web based database and the manufacturer is authorised to use the BFRC Window Energy label.
4. Further application to the Energy Saving Trust on receipt of a C rating or better will allow use of the "Energy Efficiency Recommended" endorsement label.

Detailed information on obtaining Window Energy Ratings can be found on the BFRC website: www.BFRC.org

Improving Window Energy Ratings

The overall performance of a window is dependent on the combined effect of the frame and glazing components and the air-tightness of the finished window. Ratings may be improved by decreasing thermal losses and/or by increasing solar gains.

Decreasing thermal losses

Type of low-E glass:
With its optimised balance of very low emissivity and high solar gain SGG **PLANITHERM® TOTAL** can improve the energy index for a given window by more than 5 kWh/m²/year* when compared to hard coated low-E products.

Inert gas filling:
Argon gas filling can improve the energy index for a given window by about 11 kWh/m²/year* compared to an air filled unit.

Optimised cavity width:
The optimum cavity width for an argon filled unit is 15mm (10mm with krypton).

Warm edge spacer:
Using high performance warm edge products such as SGG SWISSPACER® can improve the energy index for a given window by about 7 kWh/m²/year* compared to standard aluminium spacer bars.

Frame type:
U-values can be reduced with advanced materials and design.

**frame factor of 30% and Uf of 1.8*

Increasing solar gain

Low-iron glass:
Replacing the outer pane with SGG DIAMANT® can improve the energy index for a given window by about 6 kWh/m²/year.*

Increasing the sighted glass area:
By changing the frame design to reduce the frame factor.

Benefits of Window Energy Ratings

Growing concern for climate change and increasing energy costs to the consumer are contributing to the rapidly growing market for energy efficient products. Following BFRC certification, windows can now be added to the list of environmentally responsible options available to the end-user. For the fenestration industry this presents many benefits:

- Manufacturers can select the most cost effective components to improve their ratings
- Positively differentiates products based on a standardised method of performance
- Presents clear technical advantages for upgrading existing glazing
- Demonstrates compliance with Building Regulations and further reassures consumers through independent accreditation
- Uses a simplified system that is already recognisible to the consumer
- Promotes the use energy efficient products that may be incentivised by the goverment and endorsed by the Energy Saving Trust.

Other benefits of SGG PLANITHERM TOTAL

SGG PLANITHERM TOTAL combines excellent thermal insulation with high solar heat gain, making is one of the most energy efficient products available for WERs. In addition, SGG PLANITHERM offers many advantages over traditional hard coated low-E products:

- **More comfortable rooms** - better insulation means fewer cold spots and drafts near windows or doors.
- **Less condensation** - the inner surface of the glass stays warmer thereby reducing the likelihood of condensation.
- **Less of a tint to the glass** - this gives clearer vision through your windows and means your curtains or Georgian Bars do not look dirty or discoloured.
- **More light** - less tint also means more light can enter the room, making a more comfortable environment and reducing the need for extra lighting inside.
- **Less chance of 'haze' (dusty effect)** - this effect is more common with traditional types of thermally insulating glass due to the way it is manufactured.

SAINT-GOBAIN GLASS

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