

Bulletin



Window Energy Ratings 3 January 2007

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For the first time they offer the fenestration industry a means of justifying the use of their best-performing, highest value products to the consumer, in terms that the consumer understands and recognises.

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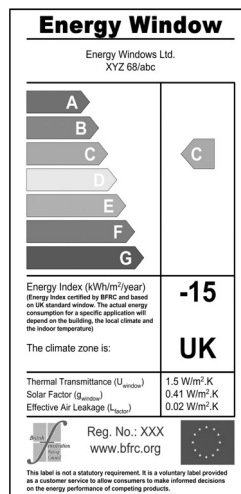
Through 2006 BFRC Window Energy Ratings (WERs) have evolved from outsider to firm favourite as the industry's chosen metric for window energy efficiency performance. Following the inclusion of WERs in Building Regulations Part L (England & Wales) the number of rated windows has increased dramatically and growth continues to accelerate. With such rapid uptake and interest, we thought it appropriate to issue a third Bulletin on Window Energy Ratings to keep you abreast of progress and issues in this critical area for the whole window industry.

The story so far

After the Glassex04 trade launch, WERs remained relatively quiet until the formal announcement in April 2006 that they would be a route to compliance under Part L of the Building Regulations in England & Wales. Subsequently, Part F in Northern Ireland has incorporated the same changes. Full details of the organisation, and how a window company can have its products rated, are given on the website www.bfrc.org. A window's Rating is determined by a formula which takes into account its total solar heat transmittance (usually referred to as g value), U value and air infiltration. The resulting value is then placed into a band on an A-G scale. This makes the system of rating windows consistent with other products which have energy performance labels (such as washing machines, light bulbs and fridges), and with which the public is very familiar.

Under Part L for England and Wales (and Part F in Northern Ireland), using Window energy Ratings as a method of demonstrating compliance, the minimum level for replacement domestic windows is band E. For windows in new domestic extensions, the minimum requirement is band D. In addition, windows achieving higher ratings bands are being used to differentiate product ranges by forward thinking companies throughout the whole of UK and Ireland, irrespective of regulatory endorsement.

Additionally, in new dwellings, BFRC Ratings are now being used to guide building professionals towards more energy efficient design and building components. The Energy Saving Trust (EST) has 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 by the use of D rated windows and Best Practice via the use of C rated windows. Whilst not mandatory, these guides will be used increasingly in any government-funded construction (e.g. social housing).



rating of band C and above are included in the list of measures approved for such support. And most recently, the EST's scheme Energy Saving Recommended (ESR), which endorses the best performing products in a category, has been extended to windows; those having band C or better will be eligible for ESR endorsement. The existence of Window Energy Ratings opens up the possibility of other forms of government support - including fiscal - in the future. see more at www.est.org.uk/myhome



Certification mark

In late 2006, BFRC became a part of Glass and Glazing Federation to ensure that appropriate management systems and organisation were developed to cope with the increasing volume demand for window ratings.

Who gets a BFRC Rating?

A BFRC Rating and label apply to a whole window (i.e. frame and glass). They do not apply to either the profile or the frame or the glass individually. Therefore it is at the point at which all these components come together to produce a whole window that the Rating and label are obtained. Usually it would therefore be the window installer's product which is rated/labelled, although in the case of a factory-glazed window it could be the window manufacturer's product.

Obtaining a BFRC Rating and label involves three stages:

1. A BFRC Certified Simulator produces an assessment report* of the window taking account of window U-value, window g-value and air leakage from testing to BS6375.
2. A BFRC Independent Agency (currently BBA or BM TRADA) ensures the window company has a satisfactory quality management system, approves the Certified Simulator's report and informs BFRC.
3. BFRC authorise, and inform the window company of, the product's Rating and give permission to them to use labels. BFRC place the product on the database on its website. Further application to EST on receipt of the appropriate Rating will allow use of the EER endorsement on the window product.

*The simulation is performed for a window to the standard GGF configuration, and the result can be applied to all products of other configurations using the same system/profile.



Although a window system or frame in itself cannot gain a BFRC Rating, it would probably be in a system/window company's interests to have an assessment report done for a window using his profile, and incorporating a standard insulating glass unit (IGU).

A BFRC Certified Simulator would probably charge about £800 for this. This could be repeated using different IGU variants in the same window at about £60 per variant. The benefit to the systems supplier is that the one report could then be used by his

customers/fabricator network (who market the same window type) as part of their evaluation by a BFRC Independent Agency.

Implications of Window Energy Ratings on glass specification

BFRC Ratings take into account both the positive (solar gain) and negative (heat loss) aspects of the glass. With low E glass, hard coat products have a greater heat loss but a higher solar gain than soft coat products. The overall BFRC Rating of a window is dependent on much more than these two factors (for example frame area, frame U value and airtightness). In general our calculations show that any given window will be rated in the same category, irrespective of whether it contains Pilkington **K Glass™** (hard coat) or Pilkington **Optitherm™** SN (soft coat). This is because the increased solar gain of a window containing Pilkington **K Glass™** is offset by its U-value performance.

How to get an improved BFRC Rating

As mentioned above, the insulation benefits of softcoat lowE are matched by the solar gain benefits of Pilkington **K Glass™**. So, if the type of low E glass is not an important variable, what factors do bring about significant changes in the Rating?



Basically, what is needed are options which either improve window U value without reducing its g value, or which improve the g value without compromising U value. Using argon in the cavity and/or warm edge spacerbar will improve the window U value, using a low iron glass such as Pilkington **Optiwhite™** will improve the g value. The magnitude of the benefits will depend on non-glass factors such as the frame U-value and ratio of glass to frame in the window. Typical ratings are shown below from working with a number of UK window companies and profile suppliers. The results show that the frame profile has a large influence on the Rating but, by combining the best available technologies, it has been proved commercially possible to achieve an A-rated window without the need for triple glazing or costly krypton filling, using the industry's low E product of choice, Pilkington **K Glass™**. For more information see www.pilkington.co.uk/WERS

The benefits of Ratings to the fenestration industry

For too long, in the context of energy conservation, glazing has been regarded by specifiers and legislators as the weak point in the building envelope. And no matter how low window U values become, they will never approach those of the walls. That is why the response of housebuilders to successive Building Regulations changes based purely on tighter U values has been to reduce window size. Clearly, reductions in window size are as unattractive for consumers as they are for architects and the window industry in general.

Now, with BFRC Window Energy Ratings, we have a system which recognises the positive energy gains through windows. This will change mind-sets; windows will be acknowledged as energy contributors, and hopefully legislators and specifiers will stop thinking in terms of reducing window areas.

Growth in consumer interest surrounding climate change coupled with the large increases in home energy costs are focussing attention onto energy efficient products; windows are no exception to this. Certification of windows through BFRC delivers the following significant marketing benefits :

- * Informs consumers of window energy efficiency in terms which can be easily understood; allowing meaningful comparisons to be made
- * Differentiates your products from those of the competition
- * Promotes products incentivised by the government to consumers
- * Reassures consumers through the product accreditation by BFRC and the endorsement of the Energy Saving Trust.
- * Increases the value and profitability of your products - higher rated windows mean higher performance through value-added components
- * Reduces consumer carbon footprint, climate change and home energy costs

So, the successful start for BFRC Window Energy Ratings has now been followed by a year of rapid growth in both rated windows and trade/consumer interest. This year looks set to become the one in which the scheme 'comes of age', receiving widespread adoption at both industry and consumer levels.

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IGU configuration (all 4mm glass and 16mm cavities)				BFRC Rating (PVCu profile performance)		
Outer pane	Gas fill*	Spacer	Inner pane	Best	Typical	Worst
Pilkington Optifloat™	air	aluminium	Pilkington K Glass™	E	E	E
Pilkington Optifloat™	90% argon	aluminium	Pilkington K Glass™	D	D	E
Pilkington Optifloat™	90% argon	warmedge	Pilkington K Glass™	C	C	D
Pilkington Optiwhite™	90% argon	aluminium	Pilkington K Glass™	C	C	D
Pilkington Optiwhite™	90% argon	warmedge	Pilkington K Glass™	A	B	C

* Whilst gas fill concentrations of greater than 90% are feasible in theory they are very difficult to achieve in practice. In any case, BFRC guidelines dictate that all IGU U-value claims should be based on a standard 90% gas-fill concentration. Please ensure that any U-value comparisons are on a like for like basis (i.e. 90% gas-fill concentration). From March 2007, EN 1279 Part 3 will more tightly control technical claims made on the U-values of gas-filled IGUs and ensure that 90% gas-fill is used.



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