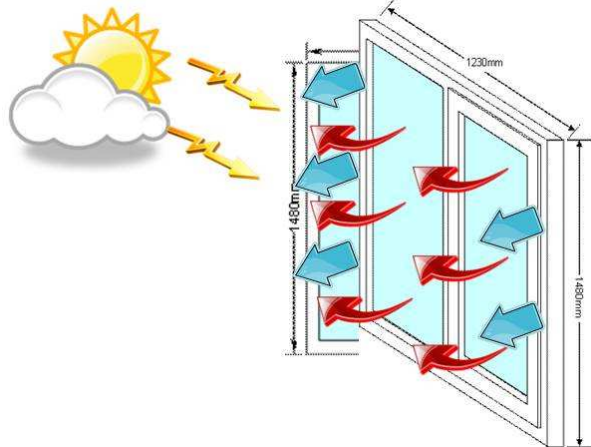


# What is the Window Energy Rating System?

The Window Energy Rating system is a benchmark for comparing the energy efficiency of different window systems.

The energy efficiency of a window is calculated using a standard window, 1230mm x 1480mm, with a fixed light next to an opening casement or sash.



The window energy rating equation includes 3 variable elements:

- +ve The heat transmitted into the building through the glass from the sun (solar gain)
- ve The heat loss from the building through thermal transmittance of the window components (expressed as the whole window U-value)
- ve The heat loss resulting from air leakage through the weather seals

$$\text{Window Energy Rating} = 218.6 \times \text{Window Solar Factor} - 68.5 \times (\text{Window U value} + \text{Air})$$

Energy Window	
Window Ltd. XYZ 68/abc	
	C
Energy Index (kWh/m <sup>2</sup> /year) <small>(Energy Index certified by BFRC and based on UK standard scenario. The actual energy consumption for a specific application will depend on the building, the local climate and the indoor temperature)</small>	-14
The climate zone is:	UK
Thermal Transmittance (U-value)	1.7 W/m <sup>2</sup> .K
Solar Factor (g-value)	0.50
Air Leakage (L-value)	0.10 m <sup>3</sup> /m <sup>2</sup> /h
	<a href="http://www.bfrc.org">www.bfrc.org</a>
<small>This label is not a statutory requirement. It is a voluntary label provided as a customer service to allow consumers to make informed decisions on the energy performance of competing products.</small>	

The energy efficiency of a window is expressed via the use of a simple energy rating label, already acknowledged by much of the general population. An example label is shown on the right.

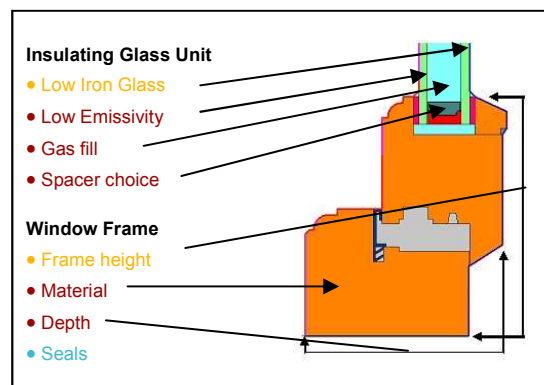
## How to design your window to achieve the best possible rating:

In order to improve window energy rating of your window you should consider the different parts of the energy rating equation:

Referring to the BFRC energy rating equation above, in order to improve the rating, the following should be addressed:

- +ve Maximise the heat gain from the sun
- ve Minimise the heat loss through thermal transmission
- ve Minimise the heat loss through air leakage

The diagram to the right outlines some of the key points to be addressed. The points are colour coded in order for you to see which part of the equation is being addressed.



Our thermal simulators have conducted trial simulations to demonstrate how you can improve the performance through small modifications to a window. Whilst every window is different, the examples below provide guidance as to what can be achieved.

**1. Frame Height Reduction**

- U Value unchanged
- Glass area increased by 3.4%
- Energy index value increased by 5 points

**2. Material Change**

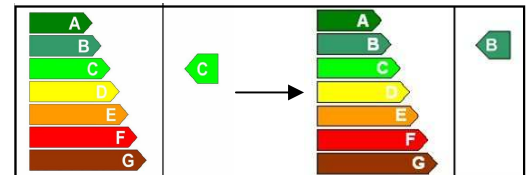
- U Value improved by 0.1 W/m<sup>2</sup>k
- Energy Index Value increased by 4 points

**3. Frame height + Material Change**

- Energy Index Value improved by 0.1 W/m<sup>2</sup>k
- Glass area increased by 3.4%
- Energy Index Value increased by 8 points

kWh/(m <sup>2</sup> .yr)	Rating Scale
>= 0	A
-10 to <0	B
-20 to <-10	C
-30 to <-20	D
-50 to <-30	E
-70 to <-50	F
<-70	G

The window energy rating is based upon a scale as shown in the table on the left. By increasing the Energy Index Value it is possible to achieve an improved rating for example from a C to a B, as shown on the right.



## How to market your energy rated windows:

- Display and refer to the window energy rating label – this is already widely used on electrical appliances and customers understand what it means
- Highlight to your customers the benefits to the end user of an energy rated window i.e. reduced energy bills
- Make your customer aware that customers are already specifying energy rated windows and that soon they will become mandatory
- An energy rated window is a premium product that should command a premium price
- Counter any price premium objections by focusing only on the cost differential element of fitting energy rated windows e.g. £1000 and the payback period for this additional sum (e.g. 2 years only based upon saving £500 a year on fuel bills)

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