

# Bulletin 2

## Republic of Ireland



01/09/02

## Building Regulations Part L - Republic of Ireland

### In Summary

**Part L of the Building Regulations is changing and will have a dramatic effect on the specification of all new and replacement windows for dwellings. A new Technical Guidance Document L has been issued containing all the detailed requirements. But they boil down to a simple picture – windows will need to have a U value of 2.2. A performance that Pilkington low emissivity glass, such as Pilkington K Glass™, will help to achieve.**

Part L of the Building Regulations covering the Conservation of Fuel and Energy in Dwellings is changing. A new Technical Guidance Document L, containing all the detailed requirements, has been issued by the Department of the Environment and Local Government. It can be obtained from the Government Publication Sales Office, or downloaded from [http://www.envron.ie/planning/tgdl\\_main.pdf](http://www.envron.ie/planning/tgdl_main.pdf). The proposed changes are radical, and will result in a significant improvement in the energy-efficiency of new and existing dwellings. The timescale of their introduction is tight; the changes for new dwellings will come into effect on 1st January 2003, and for existing dwellings on 1st July 2003. This Bulletin has been prepared to explain to you the implications of these proposals on glazing and windows.

### Key Features

- \* The changes will affect only dwellings. Proposals for changes to the Regulations for non-housing will follow later.
- \* Window U value requirements for new dwellings will be substantially improved, to 2.2 W/m<sup>2</sup>K.
- \* Replacement windows, doors and rooflights will also have to achieve the 2.2 U value.
- \* Conservatories are to be covered by the new Regulations, and their glazing will also have to achieve U2.2.

The effect of these changes will be that virtually all windows installed in both new and existing dwellings, and conservatories, will need to have a U value of 2.2, a performance that can only be achieved using low emissivity (low E) glass.

### New Dwellings

Technical Guidance Document L actually offers the architect or builder three different ways of demonstrating compliance with the Regulations.

#### a) The Elemental Heat Loss Method

This is the simplest method. In order to comply, each element of the dwelling (roof, walls, floor and windows) has to meet a specific U value. For windows, doors and rooflights this is 2.2 W/m<sup>2</sup>K. (Note, this is an average value for all the windows, doors and rooflights; any individual window does not have to meet this figure). In addition, the total area of windows, doors and rooflights should not exceed 25% of the floor area. However this area can be increased if the window U value is improved, or the U value can be relaxed if the area is below 25%, as indicated in table 2 of the Technical Guidance Document.

The energy performance of a window is dependent on the thermal efficiency of the frame *and* the glazing. The required U value of 2.2 applies to the *whole window*, ie frame and glazing. The window supplier/installer will need to demonstrate that the windows achieve this U value.

#### b) The Overall Heat Loss Method

This method sets a limit to the amount of heat loss through the fabric of the building as a whole. A formula determines the permissible average U value for the fabric of the building; there is no restriction on window U value as long as this overall average is achieved. The method therefore allows some flexibility of design.

#### c) The Heat Energy Rating Method

The Heat Energy Rating (HER) of a dwelling is a measure of the total annual energy usage for space and water heating. It is calculated according to a very detailed procedure which is set out in the Technical Guidance Document. The calculated HER of a proposed dwelling has to achieve a level related to its area/volume ratio, as given in the Document. No specific performance is required of the windows. This method enables solar heat gain through windows to be taken into account, and allows a very high degree of design flexibility.

### Existing Dwellings

Replacement windows, doors and rooflights now come within the scope of Part L. They must achieve the same average U value (2.2 W/m<sup>2</sup>K) that is required for windows in new dwellings. This may however be inappropriate in the case of some buildings of "architectural or historical interest", in which case the best insulation standards that are compatible with maintaining their character should be used.

Where the glass alone is being renewed (eg after a breakage), this is not defined as "replacement", and there is no specific U value requirement.

## Extensions to dwellings

Windows in extensions greater than 6.5m<sup>2</sup> floor area will also have to comply with the requirements for a maximum U value of 2.2 and area of 25%. If however the extension is separated from the main dwelling by walls or doors, is clearly intended for occasional use and is unheated or has a heating system with controls which are independent of the system in the main dwelling, there is no limit on window area.

## Conservatories

a) As part of a new dwelling

A conservatory built as part of a new dwelling is generally regarded as an integral part of the dwelling, so that its window U values and area must contribute to the overall limits prescribed for the dwelling. However, if the conservatory is separated from the main dwelling by walls or doors, is clearly intended for occasional use and is unheated or has an independently controlled heating system, there is no limit on the area of glazing, which must nevertheless have a maximum U value of 2.2 W/m<sup>2</sup>K.

b) Attached to an existing dwelling

The Technical Guidance Document does not distinguish between a conservatory and any other extension to an existing dwelling. A conservatory is implicitly regarded as an extension. It would therefore have to have a window area no greater than 25%, unless it is separated from the main dwelling, is intended for occasional use and is unheated or has an independently controlled heating system. In such a case there is no limit on glazed area, but it must still achieve the 2.2 U value.

## Window U values

Technical Guidance Document L shows how window U values can be obtained, in order to demonstrate that they comply with the U2.2 requirement. Where available, certified U values should be used (for example based on measurements conducted in a Hot Box to IS EN ISO 12567-1: 2000). In the absence of certified values, they should be calculated in accordance with IS EN ISO 10077-1 or 10077-2.

The results of many Hot Box tests in recent years have demonstrated that U values comfortably better than the new U2.2 requirement can be achieved with modern frames and double glazed units incorporating Pilkington K Glass™. For example, tests on PVC-U windows, incorporating double glazed units with a 16mm airspace and Pilkington K Glass™, have consistently produced U values in the range 1.8 - 1.9 W/m<sup>2</sup>K.

As an alternative, U values for particular standard permutations of glazing and frame can be obtained from table 31 in the Technical Guidance Document, although because of the conservative assumptions this table will tend to produce figures which underestimate the window performance, compared to the other methods. Another disadvantage of using table 31 is that it gives U values for only two low E glass types (emissivities 0.2 and 0.1). The U value of a window containing glass of a different emissivity can however be interpolated. For example, the most widely used low E glass is Pilkington K Glass™, which has an emissivity of 0.15; **interpolation shows that a wood or PVC-U window containing a double glazed unit comprising a 12mm airspace and one pane of Pilkington K Glass™ will have a U value of 2.2W/m<sup>2</sup>K.**

## The Pilkington range of low E glass

Product	Emissivity $\epsilon_n$
Pilkington K Glass™	0.15
Pilkington Optitherm™	0.09
Pilkington Optitherm™ SN	0.04
Pilkington Optitherm™ S2	0.02

Pilkington produces a range of low E glass products, designed to help windows meet, and considerably exceed, the requirements of the new Part L:

In order to calculate the window U value to IS EN ISO 10077, or to obtain the U value of a window from table 31 in the Technical Guidance Document, the emissivity of the glass must be known. The value for the particular Pilkington low E glass can be taken from the above table.

## Finally

The Regulations are changing, and the energy performance of domestic windows - along with that of roofs, walls and floors - will have to radically improve. Fortunately, innovations in glass technology mean that these standards are readily achievable. The Pilkington range of low E glass will enable windows to meet the new U value, and beyond.

*For further information and details of the Pilkington range of low emissivity glass contact*

**Pilkington Technical Helpline**  
**Tel. 00 44 1744 69 2000**

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For more detailed background and information visit our website: [www.pilkington.com](http://www.pilkington.com) and see the New Building Regulations section on the building products Ireland homepage. This includes summaries of manufacturers' Hot Box test reports on windows whose U values have been shown to meet or exceed the new Part L requirements.



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