Bulletin 3

Republic of Ireland

Building Regulations Part L September 2006

In summary

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

Part L of the Building Regulations, covering the Conservation of Fuel and Energy, has been updated. A new Technical Guidance Document L, containing all the detailed requirements, came into effect in July 2006. It can be obtained from the Government Publication Office, or downloaded from the website below *.

The changes are principally to put into effect the requirements of the EU Energy Performance of Buildings Directive. However the amendments also significantly improve the energy-efficiency standards for new non-housing and introduce a maximum U value requirement for replacement windows in existing non-housing. This Bulletin has been prepared to explain to you the implications of these changes on glazing and windows.

Part L prior to July 2006

Our Bulletin 2 described the changes to Part L that came into effect in 2003. As far as glazing is concerned, those changes essentially remain in place in the July 2006 Technical Guidance Document. To summarise, they were:

- Maximum window U value for new dwellings was improved to 2.2W/m^{2}K.
- Replacement windows in dwellings were brought within the scope of Part L, with a maximum U value of 2.2 being required.
- Conservatories were brought within the scope of Part L, with a maximum glazing U value of 2.2 being required.

The effect of these changes was that virtually all windows installed in both new and existing dwellings and conservatories needed to have a U value of 2.2, a performance that required low emissivity (low E) glass. The use of a hard coat low E, such as Pilkington **K Glass™**, enabled the U value requirement to be achieved.

Part L from July 2006

New dwellings

In accordance with the EU Directive, the Part L requirement for a new dwelling is now based on the calculation of its total CO_2 emissions, known as its Carbon Dioxide Emission Rate (CDER). The CDER must be no greater than the maximum value permitted by Part L. It is calculated using the Dwellings Energy Assessment Procedure (DEAP), which has been published by Sustainable Energy Ireland. In addition however, there are upper limits placed on heat loss through the building fabric; these are the same as before, which means the maximum window U value figure remains at 2.2 W/m^{2}K. There is some leeway to alter this figure though if the total area of external doors, windows and rooflights differs from 25% of floor area, by undertaking an area-weighted U value calculation.

Existing dwellings

The requirement for windows in extensions, conservatories and replacement windows in existing dwellings remains at a maximum U value of 2.2 W/m^{2}K.

New buildings other than dwellings

Although the EU Directive requires that a total energy or CO_2 emissions method should form the basis of the requirement for new build, the calculation methodology has not yet been finalised. According to the preamble in the new Technical Guidance Document, this will not take place until the next Part L amendment scheduled for 2007. Until then, Part L for buildings other than dwellings remains based on fabric heat loss performance.
The reference U value for windows however has been significantly improved, to a maximum of 2.2. As for dwellings, this means low E glazing will be required; the use of a hard coat low E, such as Pilkington **K Glass™**, will enable the requirement to be achieved.

Part L also requires that a building should be designed to avoid solar overheating (if naturally ventilated) or excessive plant capacity (if mechanically ventilated or cooled). Criteria and calculation methods are given in the Technical Guidance Note.

* http://www.environ.ie/DOEI/DOEIPol.nsf/wvNavView/wwdConstruction?OpenDocument&Lang=en.

Guidance Note. These enable the advantages of solar control glass to be taken into account.

Existing buildings other than dwellings
For the first time, replacement windows in existing non-dwellings are covered by Part L. They must achieve a U value no greater than 2.2 W/m^{2}K. Windows in extensions, including conservatories, must also achieve U2.2.

Window U values

Technical Guidance Document L refers to BRE Report BR443 "Conventions for the Calculation of U values" for guidance on how the U values of components, including windows, are to be obtained in order to demonstrate compliance with Part L. BR443 in turn says that window U values can be obtained from measurements conducted in a Hot Box (to IS EN ISO 12567-1: 2001). TGDL and BR443 also say that window U values may be obtained by calculation (in accordance with IS EN ISO 10077-1: 2000 or IS EN ISO 10077-2: 2000).

The results of many Hot Box tests in recent years have demonstrated that U values comfortably better than the 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^{2}K.

As an alternative, U values for particular standard permutations of glazing and frame can be obtained from table 36 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 36 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^{2}K. Improvements in U value can be achieved by increasing the cavity (to say 16mm) and by using argon filling. Interpolation from table 36 shows that a wood or PVC-U window with a unit containing one pane of Pilkington **K Glass™** and a 16mm cavity with argon would have a U value of 1.9.

Building Energy Rating Certificates

The EU Energy Performance of Buildings Directive requires a system of energy certification to be introduced, for both new buildings and existing buildings when put up for sale or rental. In the Republic of Ireland these will be known as Building Energy Ratings (BERs). A BER certificate will not only show the energy performance of the building, but will include an advisory report setting out ways of improving its performance, to be taken into account when future work is done on the building.

The timetable for the introduction of BERs has been set down in the government's Review of National Climate Change Strategy, published in July 2006. This is as follows:

- BER of new dwellings, 1 January 2007
- BER of new non-domestic buildings, 1 January 2008
- BER of existing buildings when sold or let, 1 January 2009

BERs are therefore not covered by the July 2006 version of Part L, but are likely to feature in future Part L revisions.

Part F in Northern Ireland

The intention to amend Part F of the Northern Ireland Building Regulations has been announced, and we will issue a Bulletin summarising the changes as soon as they are published. In many respects the new Part F will be very similar to the new Technical Guidance Document L, particularly in the requirement - for the first time - for all replacement windows to achieve a performance standard which will mean low E glass is effectively compulsory. However, under Part F, one way of demonstrating compliance for domestic replacement windows will be through the use of Window Energy Ratings (WERs), as opposed to U values. These ratings, which classify a window on an A to G scale, provide a fairer, more accurate and consumer-friendly way of expressing performance compared with the traditional U value. We are likely to see the use of WERs spread throughout Europe in the near future.

Finally

Part L is changing, and the energy performance of non-domestic windows will have to radically improve and match the performance that has been required by domestic windows since 2003. This will include all replacement windows. The use of double glazing containing Pilkington **K Glass™** will enable all these standards to be achieved. Pilkington **K Glass™** is also the ideal product to enable high Window Energy Ratings to be achieved, as the trend towards WERs in domestic windows develops.

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For more detailed information visit our website: **www.pilkington.co.uk/buildingregulations** and see the Building Regulations section relating to Part L in Ireland. This section 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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