

Bulletin 1

Northern Ireland



REVISIONS TO BUILDING REGULATIONS PART F

In summary

Part F is changing dramatically.

New Technical Booklets were published in August and come into force on 30 November. As well as making radical changes to the way new buildings are assessed for compliance, the

Booklets introduce strict requirements for replacement windows in existing buildings.

In new buildings, designers and builders will demonstrate compliance by calculating the total carbon dioxide emissions of their building. There will be considerable freedom in the specification of individual components, so long as the overall emissions target is met. However, there will also be a minimum performance requirement for the windows, which is a U value of 2.2.

In existing dwellings, replacement windows will come within the scope of Part F for the first time. They will need to achieve either a specific U value or a minimum Window Energy Rating. The latter is a new concept, developed and run by the British Fenestration Rating Council. The replacement window requirement will be either a maximum U value of 2.0 or a minimum Window Energy Rating of band E. For existing non-dwellings, replacement windows will require a maximum U value of 2.2.

All of these standards will require the use of double glazing incorporating low E glass.

Pilkington **K Glass**TM, the most popular low E glass, will enable windows to achieve all the necessary U values and Window Energy Ratings.

After a lengthy consultation period, new Part F Technical Booklets were published by the Department of Finance and Personnel (DFPNI) in August 2006. They will come into effect on 30 November 2006. They are available on the DFPNI website*. Two Technical Booklets will replace the current one, the two covering separately dwellings (both new and existing), and “buildings other than dwellings” (both new and existing). This Bulletin has been prepared to give you a summary of the standards for glazing and windows in each of the Technical Booklets.

It should be borne in mind that the Technical Booklets only contain standards which are “deemed-to-satisfy” the functional requirements of the Building Regulations, and that other methods to demonstrate compliance can theoretically be used. However, for all practical purposes, the contents of the Technical Documents can be regarded as obligatory.

Technical Booklet F1

New Dwellings

The 1998 Part F Technical Booklet gave designers two alternative routes to compliance; Elemental U values or Target U values (ie trade-off). In the new Technical Booklet F1, these options disappear and are replaced by a “Target carbon dioxide Emissions Rating” (TER). As the term implies, this is a calculation of the carbon dioxide emissions resulting from the energy consumption of the whole house. The only way of demonstrating compliance with the energy requirements will be to calculate the emissions of the house, using standard government “SAP” software, and ensure the emissions level (of both the designed and constructed building) is no higher than the TER.

The government software utilises the solar transmittance (g value) of the glazing as well as its heat loss, and therefore fully takes into account the positive energy aspects of the window when calculating the carbon dioxide emissions.

The house designer will have complete flexibility on window design although, in order to avoid excessive trade-off and condensation risk, a maximum average window U value of 2.2 W/m²K will be imposed.

Implications for glazing

Because the government software takes into account solar gains, low emissivity (“low E”) glass with a high g value (ie hard coat) will generally result in a house having a similar carbon dioxide Emissions Rating to one with soft coat low E. The maximum window U value of 2.2 means that ordinary (ie non low E) double glazing will no longer be permissible in new housing.

Existing Dwellings

Replacement windows

There will be three alternative deemed-to-satisfy standards, which are given in table 3.1 column (b) of the Technical Booklet. These are (1) a whole window U value of 2.0 W/m²K or (2) a glass centre pane U value of 1.2 or (3) a Window Energy Rating of band E. Window Energy Ratings are a relatively new development, administered by the British Fenestration Rating Council (BFRC). They take into account useful solar heat gain and ventilation losses, as well as the traditional conduction losses, and combine them into a single rating on an A-G scale. Pilkington has prepared a Bulletin specifically on Window Energy Ratings (WERs), with detailed information on what WERs are, and how to obtain them.

Extensions

There will be three alternative methods. One option is to show that the area-weighted U value of all the external elements of the extension is no greater than if there were 25% glazing (expressed as a percentage of floor area) of U value 1.8, along with the prescribed opaque U values and areas. The second option is to undertake a SAP evaluation to establish that the base dwelling plus extension has no higher emissions than the house plus extension designed to the standard in the first option. The final option is simply to specify a window of band D Window Energy Rating and glazing area no greater than 25%.

Conservatories

Conservatories greater than 30m² floor area will require a maximum window U value of 2.0 W/m²K, or a maximum centre-pane U value of 1.2, or a Window Energy Rating of band E. Conservatories no greater than 30m² are exempt from this requirement, provided

* <http://www.dfpni.gov.uk/index/laws-and-regulations/building-regulations/br-technical-booklets.htm>

they are thermally separated from the host dwelling and that any heating equipment has its own controls.

Implications for glazing

The fundamental change is that replacement windows come within the scope of Part F. Windows will invariably require low emissivity (low E) glass. The prescribed U values and Window Energy Ratings will enable hard coat low E glass such as Pilkington K Glass™, to be used wherever preferred.

Technical Booklet F2

New Buildings other than Dwellings

As with the new Part F for dwellings, the means of demonstrating compliance with the energy requirements will be on the basis of total carbon dioxide emissions of both the proposed and completed building. The emissions will be calculated using government approved software, called SBEM (or similar approved software), and must meet a target value. There will be freedom on the specification of individual components – subject to some limits. In the case of windows, a maximum average U value of 2.2 W/m²K must be achieved. This can rise to 2.7 in exceptional cases where the building has “high internal heat gains” (which are undefined). Display windows and similar glazing will however be exempt from all upper limits on U value.

Implications for glazing

The government software takes account of the heat loss, solar gain and daylight transmission of the glazing. The significance of each factor will vary according to the building type and whether it is air-conditioned or naturally ventilated. Given the wide variety of building types, it is not possible to come to overall conclusions about the impact on glazing; however the upper limit on U value of 2.2 means that non low E glazing will no longer be permissible.

Existing Buildings other than Dwellings

Replacement windows

There will be two alternative deemed-to-satisfy standards, which are given in table 3.2 column (b) of the Technical Booklet. These are either achieving a whole window U value of 2.2 W/m²K or a glass centre pane U value of 1.2. The whole window U value can rise to 2.7 in exceptional cases where the building has “high internal heat gains”. For non-housing that is “essentially domestic in character” (eg student accommodation or care homes), a third option will be to use Window Energy Ratings; a band E window will comply.

Extensions

The Technical Booklet distinguishes between large and small extensions; a large extension (greater than 100m² floor area and 25% of the floor area of the existing building) must achieve the same requirements as if it

was a new building. For small extensions there are three options. One option is to show that the area-weighted U value of the external elements is no greater than if the windows had a U value of 1.8 and an area of 30% of the wall (in the case of residential buildings), 40% in the case of offices, shops and places of assembly, and 15% in the case of industrial buildings, along with the prescribed opaque U values and areas. The second option is to undertake an evaluation to establish that the base building plus extension has no higher CO₂ emissions than the building plus extension designed to the standard in the first option. The final option, for extensions that are “essentially domestic in character,” means compliance can be achieved simply by using a window which is energy rated to band D and within a prescribed maximum window area.

Consequential Improvements

This is a new concept, arising from the new EU Directive on the Energy Performance of Buildings. Technical Booklet F2 says that a building of greater than 1,000m² floor area, when having an extension constructed or an increase in the capacity of its building services, must have its existing windows replaced if they have a U value worse than 3.3. The required maximum U value of the replacement windows is to be 2.2W/m²K (or centre-pane U value of 1.2).

Conservatories

Conservatories greater than 30m² floor area will require a maximum window U value of 2.2 W/m²K, or a maximum centre-pane U value of 1.2. Conservatories no greater than 30m² are exempt from this requirement, provided they are thermally separated from the host building and that any heating system has its own controls.

Implications for glazing

The fundamental change is that replacement windows come within the scope of Part F. Windows will invariably require low E glass. The deemed-to-satisfy U values and Window Energy Ratings will enable hard coat low E glass such as Pilkington K Glass™, to be used wherever preferred.

Overview

The various changes to Part F effectively make low E double glazing mandatory in all applications:- new buildings, replacement windows, extensions and large conservatories. In those parts of the Regulations where maximum U values or minimum Window Energy Ratings are set, these can be achieved by the use of windows containing hard coat low E such as Pilkington K Glass™, double glazing. There are other aspects of the new Part F which will be of interest to the fenestration industry, but less directly so. All these will be covered in more detailed Pilkington technical literature.



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All of these standards will require the use of double glazing incorporating low E glass. Pilkington K Glass™, the most popular low E glass, will enable windows to achieve all the necessary U values and Window Energy Ratings.

For more detailed information visit our website:

www.pilkington.co.uk/buildingregulations

and see the Building Regulations section relating to Part F in Northern 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 F requirements.