Bulletin 8

Building Regulations (England & Wales) Part L

August 2008

In Summary

A roadmap for changes to Part L in England & Wales has been presented to industry by the Government. Changes will be introduced in 2010, 2013 and 2016 gradually improving the energy efficiency of buildings.

In 2010 new dwellings will have to be 25% more efficient than those complying with the current Part L. Designers and builders will continue to demonstrate compliance by calculating the total carbon emissions of the building. This method avoids the need for prescriptive performance levels such as U value and enables positive benefits such as solar gain to be taken into account.

For existing housing, it is expected that the minimum compliance level for replacement windows of Window Energy Rating band E (or band D for extensions) will increase moving towards band A in 2016.

By taking into account solar gain, it can be demonstrated that larger glazed areas need not have a negative impact on the carbon footprint of a building, rather they can improve energy efficiency by offsetting space heating needs. Therefore products such as Pilkington **K Glass™** and Pilkington **energiKare™** energy efficient glazing are well placed to help satisfy the requirements of the changed regulations in future.

The Government's CLG (Department for Communities and Local Government) has a well-publicised roadmap for improving the requirements of Part L, in stages, up to 2016. The first milestone will be changes to Part L in 2010, and the process for producing these changes is under way. This Bulletin gives you information on the process, the timetable and also indicates what the implications for windows and glazing are likely to be.

The Roadmap

It has been well publicised by the Government that they will make significant step changes to Part L of the Building Regulations for England & Wales. In response to requests from industry that a clear long term framework be given, CLG have mapped out the dates and improvement increments right through to 2016. This is intended to give industry maximum opportunity for business planning and product development.

In 2006, immediately after the last change to Part L, the following roadmap for dwellings was published:

Date	2010	2013	2016
Energy/Carbon improvement compared to Part L 2006	25%	44%	100% (ie zero carbon)

For non-dwellings, CLG's targets are not yet set in concrete, but their latest thinking is to adopt the same improvement levels as for dwellings in 2010 and 2013, but delay the zero-carbon standard until 2019.

This does not mean that every component of a building will have to improve by, for example, 25% in 2010. The requirements for new buildings are – and will continue to be – based on the total energy performance of the whole building. However, it can generally be assumed that builders and architects will expect windows to play their part in delivering these overall improvements. In the case of replacement windows, CLG have indicated that, because the requirements in the 2006 Part L were effectively unchanged from the 2002 version, they anticipate making substantial improvements for 2010.

The Part L 2010 revision process

CLG have already set up a pyramid of Industry Advisory Groups and Sector Working Groups to help them develop a set of proposals to issue for public consultation. The envisaged timetable after that is;

- **Issue public consultation document early 2009**
- **Consultation period of 3 months (ie closing Spring 2009)**
- **Post-consultation review complete Autumn 2009**
- **New Part L published by end of 2009**
- **New Part L coming into force 2010 (possibly April)**

What is the new Part L likely to require of glazing and windows?

This question needs to be addressed in two parts – new buildings and replacement windows – as the Building Regulations approaches them in entirely different ways.

New buildings

It must be remembered that the days when Building Regulations were written in terms of prescriptive levels of performance for each element are long gone. Today the criterion for compliance is the total energy/carbon performance of the whole building, expressed as the CO_2 Dwelling Emission Rate (DER) calculated according to an approved method such as SAP (for new dwellings), or as the Building Emission Rate (BER) calculated according to the SBEM methodology (for new non-dwellings). The level of total energy consumption set in 2010 will, by definition, be 25% lower than in the current Regulation. Part L 2010 will not require any specific performance of windows, just as the current 2006 Part L does not.

Existing buildings

In 2006, Window Energy Ratings became a criterion for compliance for windows in existing dwellings and domestic-style buildings, a band E being required in replacement windows and a band D in extensions. It can be assumed that these levels will be increased in 2010, and that the intention is probably to move towards band A being the requirement in 2016.

U values are also an option for demonstrating compliance for replacement windows and windows in extensions under the current Part L. However, it is not known whether these options will continue in 2010 because Window Energy Ratings, due to their more accurate reflection of energy performance, are regarded as a superior and more reliable criterion.

What factors will determine the windows to be used in a 2010-compliant building?

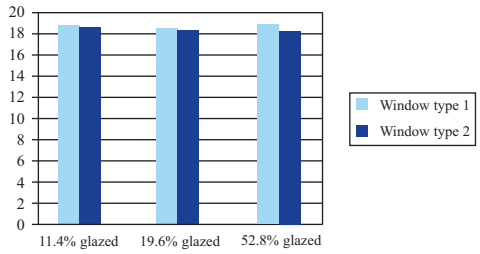
For new buildings, the SAP and SBEM software fully take into account the U value, solar heat gain (g value) and daylight transmission characteristics of the windows. Therefore the positive, energy-gaining qualities of glass are embedded in the calculations.

As a rough rule-of-thumb, an improvement in glass U value is accompanied by a deterioration (ie reduction) in g value, and the two factors tend to balance each other out. This means that the total energy performance of a building is largely independent of the glass U value.

Similarly, because for many orientations the level of useful solar gains through a window counter-balances its heat losses, the energy performance of a building is largely independent of its window area.

This is illustrated in the graph which shows the DERs of a typical mid-terrace house, with six widely-differing glazed areas (% of external wall) and window U values. Windows 1 and 2 are double glazed with hard coat (such as Pilkington **K Glass™**) and soft coat low E respectively, in conventional frames. Both have 16mm argon-filled cavities, resulting in the glazing units having U values of 1.5 (window 1) and 1.2 (window 2).

Relationship between DER, window type and window area; mid-terrace house, windows facing due E & W only



This produces two important conclusions;

- **At the % areas of glazing typical in dwellings, significant changes in U value arising from the type of low E glass have no significant effect on DER**
- **DER is also virtually independent of window area**

The graph is for housing, but parallel studies for commercial buildings are reaching the same conclusion. Building Magazine recently reported* on KPMG's 14-storey corporate offices currently taking shape at Canary Wharf. This is a gleaming glass-clad building which, in addition to having a BREEAM "excellent" rating, has calculated CO_2 emissions meeting the standards anticipated for the 2010 Part L. This shows that if a building is designed to take advantage of the positive energy benefits of glass – solar heat and daylight – future Building Regulations will not inhibit the use of highly-glazed facades.

All this is good news for building designers and window/façade companies. The ways in which windows are evaluated in the context of Part L – whether it is SAP or SBEM for new build, or Window Energy Ratings for existing buildings – fully take into account the positive energy benefits of glazing. This means liberation from the traditional fixation with U values, and that the full benefits of larger areas of glazing are recognised.

* *"A Comforting Vision of L" Building Magazine Building Regulations supplement, April 2008.*

To summarise

Part L will change in 2010, and the revision process is now underway. It is already known that new buildings will have to be 25% more energy efficient than those complying with the current Part L.

As is the case with the 2006 Part L, all aspects of windows will be taken into account when the total energy/carbon performance of a building is evaluated. This means that the benefits of solar gains are rewarded through the use of products such as Pilkington **Optiwhite™** low iron glass. It also means that no specific window U value will be required.

SAP evaluations of a typical new dwelling show that its DER is virtually independent of window U value and area. This provides designers and builders with tremendous freedom; the old fixation with U values is no longer a constraint and large glazed areas do not need to be penalised.

For replacement windows in domestic situations, Window Energy Ratings will certainly be retained as the primary route to compliance, again ensuring that the positive energy aspects of windows are recognised The required level however will undoubtedly increase from the current position of E for replacement windows and D in extensions. Hence windows achieving higher ratings (such as those containing Pilkington **energiKare™**) will continue to meet and exceed the requirements of these regulations..

Pilkington will keep you updated on progress with revisions to Part L in subsequent Bulletins.

The Code for Sustainable Homes

You may well have heard of the Code for Sustainable Homes (CSH), and perhaps wondered how it is connected with Part L.

The Code is a document produced by CLG, which enables the "sustainability" of a new home to be assessed. Sustainability however covers many environmental impact issues. The CSH therefore assesses factors such as water consumption, the sourcing of materials, waste in all its forms, surface water run-off, sound insulation, daylighting, the ecology of the site and – of course – CO_2 emissions. Each of these is evaluated and the home is given an overall CSH rating in the range Level 1 to Level 6 (with 6 being the best).

In order to achieve a particular CSH rating level however a minimum DER must be achieved, as shown in the table;

CSH Level	1	2	3	4	5	6
Percentage improvement in DER compared to 2006 Part L requirement	10%	18%	25%	44%	100%	Zero carbon

Therefore, for example, if a dwelling achieves the 25% improvement standard promised for the 2010 Part L, it would also attain CSH Level 3, provided all the other relevant sustainability measures were achieved.

The CSH is not part of the Building Regulations, and there is no legal requirement to achieve any specific CSH Level.

However, because the methodology for calculating CO_2 emissions is the same as is used in Part L, the same conclusion about the effect of windows can be drawn; namely that the CSH Level of a new dwelling is going to be largely independent of the U value and size of its windows.

Overview

The last changes to Part L recognised that it is important to take into account the solar gain provided by glazing on the energy performance of a window since consideration of U value alone would be an incomplete and misleading guide to the performance of a window. Future changes are expected to reinforce this thinking with Window Energy Ratings being the key measure for replacement in existing dwellings. SAP calculations show that in a typical new home the Dwelling Emission Rate is virtually independent of the window U value and size so that designers no longer need to fix on U value as being a constraint to providing large glazed areas. Using Pilkington **K Glass™** in IGUs or energy efficient glazing such as Pilkington **energiKare™** will therefore enable windows to comply with the new regulations. More details are available in Pilkington literature and at www.pilkington.co.uk /buildingregulations .

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