

Future demands on window design

TRADA Consultant Architect Patrick Hislop RIBA reviews the increasing demands placed by legislation and codes on window design



Changes in the Building Regulations and the introduction of several of the new codes, intended to improve both the thermal performance of buildings and reduce their carbon footprint, will have a significant effect on the future design of windows of any material.

While wood windows have some inherent advantages in terms of their thermal conductivity and sustainability credentials, which will add to their appeal and acceptability

under the various codes, the industry cannot complacently assume that this will be sufficient to ensure the continued popularity of wood.

The German Passivhaus code, for instance, which is beginning seriously to affect the design of windows elsewhere in Europe, means that even solid wood window frames alone will no longer achieve the thermal insulation standard required: wood frames will need to incorporate the sort of thermal breaks previously only required in aluminium frames.

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The more advanced European designs therefore now incorporate low-density wood or foam plastics in the laminations to reduce the thermal conductivity of the wood. Triple glazing, low emission coatings and gas filling are also essential to meet the typical thermal insulation standard of 0.8 W/m²/K as proposed under this code.

Improved thermal insulation will in any case require thicker IGUs, which will mean substantial increases in the size of wood window profiles to provide adequate space for the glass. Even without the need for thermal breaks, laminated sections will become more economical for these larger sections, particularly if they overcome the need to cut away large sections of solid wood to provide the glazing platforms and rebates necessary. The extra material needed to provide the typical UK ‘stormproof’ profiles may eventually lead to the final demise of this type of window, other than for replacement windows to match existing designs.

Double weatherseals may also become more common than the single seals currently used on opening lights in order to reduce heat loss between opening light and frame and this will affect the design of profiles. However, the increased use of mortice locks, espagnolette bolts and internal restrictors now mean that the sub-frames do not have to be thicker than the opening light frames to provide space for the hardware, offering a possible saving in





Kleinhans GmbH, a BM TRADA Q-Mark member, supplies windows to Passivhaus developments in Germany

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material as well as the potential of a flush internal appearance to wood windows.

It is not only the improved thermal insulation and airtightness standards that will affect window design in the future. Windows may also have to incorporate solar protection, as well as meeting high standards of weather resistance, security, ventilation, ease of operation, and possibly acoustic protection already required.

Wood windows have always had a reputation for a high level of maintenance, which with modern factory painting and glazing is largely unjustified, but currently this does feature in any 'life cycle' costing in terms of money or energy consumption. Despite this, there is increasing interest amongst architects in specifying wood windows for their appearance and sustainability, particularly for 'one-off' house designs and non-residential buildings. To avoid the need to repaint the external wood, particularly on multi-storey buildings, there is now a growing interest in the UK in the use of aluminium clad wood window designs, which have been popular elsewhere in Europe for some time, and which are becoming more generally available in the UK.

These changes are unlikely to affect the speculative housing market in the immediate future, where there may be currently an increasing substitution of PVCu windows for wood. However, they will certainly be reflected in building design aiming to achieve the high levels of performance and sustainability



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set out in codes such as BREAMM and Code for Sustainable Homes. The even higher levels of performance required by schemes such as Passivhaus may take longer to be accepted in the UK, but do represent a trend that will inevitably reach the UK building industry at some point.