

TECHNICAL PAPER TD030702 **INSULATED DOORS - APPROVED DOCUMENT L2 2002 (1)**

THE STANDARD

On April 1st 2002, the new Building Regulations Approved Document L2 "Conservation of Fuel and Power in Buildings other than dwellings" came into effect.

With the introduction of this document, building designers must now prove compliance with strict guidelines for energy conservation, using one of the following methods:-

- a) An Elemental Method, where each element of the building is considered individually and a minimum level of performance should be achieved by each element (with some 'trade-off' between different elements).
- b) A Whole-Building Method, where the performance of the whole building is considered and the carbon emissions of heating, ventilation, air conditioning and lighting must comply with Energy Consumption Guide 19 DETR 1998.
- c). A Carbon Emissions Calculation Method, which is similar to method (b) but can be applied to any building type. The annual emissions must be no greater than that of a notional building that meets the compliance criteria of the Elemental Method.

As Methods (b) and (c) would involve considerable calculation and would therefore be time-consuming and costly, we must assume that the most popular design approach will be (a), the Elemental Method.

Table 1 of the Standard gives minimum guideline values for various construction elements and by specifying product which complies with these values, the building designer is deemed to have complied with the Standard.

e.g.

Walls, including basement walls	= 0.35 W/m ² /K ^o .
Windows, roof windows and personnel doors (area weighted average for the whole building) glazing in metal frames.	= 2.20 W/m ² /K ^o .
Windows, roof windows and personnel doors, (area weighted average for the whole building) glazing in wood or PVC frames.	= 2.00 W/m ² /K ^o .
Vehicle Access and similar large doors	= 0.70 W/m ² /K ^o .

THE PROBLEM FOR THE STEEL DOOR INDUSTRY

Our basic OMEGAGP, OMEGASE and OMEGAFR doors are constructed from 1.2mm steel skins and infilled with a 42mm thick honeycomb craft-paper core, in common with the standard products offered by the other major members of the steel hinged door industry.

The core in this type of door relies on the formation of 42mm wide "cells" of captive air to achieve its rigidity and performance.

It has a very high strength-to-weight ratio due to the honeycomb core and excellent performance in fire due to the small amount of combustible material when compared to timber door products.

The honeycomb-cored steel doorset has been used in internal and external applications for over 30 years.

When BRE Digest 108 - "Standardised 'U' Values", was first issued in 1969, it did not give specific guidance for the calculation of "U" values for **captive** air cells and therefore 'U' values for the honeycomb-cored door product had to be based two 1.2mm steel skins separated by a 42mm column of static air.

The basic cross-sectional 'U' value of this type of door construction was therefore calculated at $2.79 \text{ W/m}^2/\text{K}^\circ$ and even though the industry knew that the door would actually achieve better than this due to its closed cell construction, it did not matter, as **insulation was not a requirement on hinged personnel doors.**

However, with the introduction of L2 2002, the Elemental Method requires doors to achieve $2.2 \text{ W/m}^2/\text{K}^\circ$, and as there is still no guideline for calculating the 'U' value of closed-cell honeycomb-cored doors, a different door construction needs to be considered.

THE SOLUTION

In anticipation of this change in the Standard, Omega introduced OMEGATI doorset in August 2000, which includes a polyurethane core. This door is now available in all our standard sizes and configurations, including overpanels and sidepanels, etc., and double or triple-glazed window systems can also be fitted, in accordance with the Standard.

The cross-sectional 'U' value of the polyurethane-cored leaf, including an allowance for all standard reinforcing within the leaf is $0.548 \text{ W/m}^2/\text{K}^\circ$.

There will be a performance reduction at the joint between the door and the opening structure, due to the standard 5mm tolerance airgap (sealed by mastic on both sides), plus the thermal bridging at each fixing point, caused by the steel packing shims and steel fixings.

There are no guidelines for this in the Standard, other than a comparison between indicative 'U' values for windows with wood or PVC frames (Table A1) and 'U' values for windows with metal frames (Table A2).

Generally, the metal-framed option shows an increase in thermal transmission of $0.6 \text{ W/m}^2/\text{K}^\circ$.

This figure should be adjusted by a further $0.3 \text{ W/m}^2/\text{K}^\circ$, as defined in the Standard, as the frames do not include a thermal break.

The "installed" 'U' value of our polyurethane-cored steel doorset should therefore be in the region of $1.484 \text{ W/m}^2/\text{K}^\circ$, which is well within the requirements of the new Standard.

When quoting this product, thresholds and seals should also be included in your price build-up.

This product is an addition to our range of standard honeycomb and fire insulation cored doorsets:

OMEGAGP All general-purpose or security options, where there is no requirement for compliance with Approved Document L2.

OMEGATI All general-purpose or security options, where compliance with Approved Document L2 is required.

OMEGAFR All fire-rated applications, where fire performance up to 4 hours integrity may be specified

OMEGAFRI All fire rated applications where up to 4 hours integrity & 60 minutes insulation may be specified

OMEGASE Sold Secure security certified

Please note:

This document is issued for general information and is not intended as a substitute for information contained in the British Standard referred to in the text.

Standards are under constant re-appraisal, and it is therefore essential that the full document be consulted when required.

Technical Department 03/07/02