

TIMSA: Statement on Multi-foils

The heated debate over the thermal resistance of multi-foil insulation materials over the past two years has been resolved by the issue of BR 443 - Conventions for U-value calculations: 2006, the development of an EOTA CUAP (Common Understanding of Assessment Procedure) for an ETA and by the acceptance, by the NHBC and others, of the test methods advised in these documents. This has been reinforced by the issue of a BBA Certificate (06/4379) for the Thinsulex™ multi-foil to Web Dynamics Limited, a TIMSA member. All other TIMSA members, whose products include reflective layers, adhere to the BR 443 requirements for declaring product and system thermal values.

Multi-foils function by limiting heat transfer by conduction, convection and radiation. They require still air cavities to either side of the insulation to gain the full benefit of the low emissivity (highly reflective) surfaces.

BR 443 specifies that multi-foil thermal performance be established either from measurement of the thermal resistance of the core according to BS EN 12664/12667 together with the emissivity of the surfaces or in a Hot Box apparatus conforming to BS EN ISO 8990. The Hot Box test method is able to account for all methods of heat transfer, conduction, convection and radiation since the still air spaces adjacent to the outer surfaces of the multi-foil can be replicated in the test unit. It is also possible to test the product as installed, for instance including the effect of battens, compression and 'billowing'. In situations where battens compress the multi-foil product or modify the shape of the product between battens, these effects cannot be dealt with other than by Hot Box measurement. Where the effect of battens is included in the Hot Box measurement, the result applies only to the specific batten dimensions and spacing used in the Hot Box test.

In contrast, some multi-foil producers have been claiming thermal resistances or U-values based upon unproven, and therefore non-approved, comparative field test methods. These non-approved methods give apparent thermal values significantly better than those obtained using the Hot Box method. TIMSA does not accept thermal resistance values or U-values based on such methods and advises that such values should not be accepted for any project under current Building Regulations: Part L-2006.

To date, one manufacturer, Web Dynamics Limited, has established the performance of its product, Thinsulex™, according to the Hot Box test and its thermal resistance has been confirmed and published in its BBA Certificate. This certificate also confirms that multi-foil insulation materials, when properly installed, can contribute to a significant reduction in heat loss by convection by acting as an air barrier and restricting air leakage. As such, approved multi-foil insulation materials such as Thinsulex™ can be used advantageously with other types of insulation materials to meet the requirements of Part L.

TIMSA, therefore, recognises that multi-foil insulation materials, when tested for their in-use thermal performance according to the approved methods defined in BR 443, provide a valuable addition to the range of insulation materials available from the thermal insulation industry.

Multifoil Insulation Materials

Multi-foil insulation comprises products that consist of several layers of foil separated by other materials. They are intended for applications with an airspace on either side and the overall thermal performance includes the effect of low-emissivity surfaces facing these airspaces.

BR 443 - Conventions for U-value calculations: 2006

This document gives guidance on the use of the calculation methods for determining U-values that are based on standards that were developed in the European Committee for Standardisation (CEN) and the International Organisation for Standardisation (ISO) and published as British Standards.

It provides guidance by:

- indicating the method or methods of calculation that are appropriate for different construction elements;
- providing additional information about using the methods;
- providing data relevant to typical UK constructions.

This document is directly referenced to by Building Regulations Part L: 2006 Approved Documents and can be accessed by following this link [BR443](#) .

Hot Box

It is more correctly referred to as the Guarded Hot Box. It is used to measure steady-state thermal transmission properties of homogeneous and non-homogeneous specimens. For the latter a representative sample of a composite assembly of building materials can be built to fit the test apparatus. The test procedure is given in the international standard BS EN ISO 8990: 1996.

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