

**Use of multi-foil insulation products and compliance with Regulation 7 and Building Regulation Requirement L1****Purpose**

BCA Technical Guidance notes are for the benefit of its members and the construction industry, to provide information, promote good practice and encourage consistency of interpretation for the benefit of our clients. They are advisory in nature and in all cases the responsibility for determining compliance with the requirements of the Building Regulations remains with the Building Control Body concerned. This guidance note is based upon information available at the time of issue and may be subject to change. This guidance note supersedes all previous versions.

**Introduction**

For most Building Control Bodies in England & Wales, the first experience of multi-foil insulation systems came in the mid 1990's when the product started to be used for insulating loft conversions. While the claims made for very high levels of insulation were almost universally greeted with scepticism within the profession, many did ultimately choose to accept multi-foil insulation systems on the basis of "certification" provided by a reputable testing organisation.

Over time, however, the testing which formed the basis of this original acceptance has been more widely scrutinised, particularly as the tests were not carried out to the existing National, European or International standards relating to insulation products.

The original Guidance Note issued in August 2006 considered these issues and provided advice to Members based on the situation at that time. That guidance was subsequently updated in 2008 to reflect the outcome of a Judicial Review into the introduction of changes made in the 2006 edition of Part L and the issue of new guidance from DCLG. Ultimately, the Judicial Review did not significantly change or clarify the technical issues surrounding the use of multi-foils in anyway.

In light of the publication of **BS EN 16012:2012 – Thermal insulation for buildings – Reflective insulation products – Determination of declared thermal performance** on 29 February 2012 and the continuation of individual manufacturers using comparative testing in lieu of harmonised methods it is now appropriate to review the advice given and update Members accordingly.

**Key Issues**

The key issue of concern relates to the way that the thermal performance of multi-foil products is tested. For many years the appropriate method for determining insulation performance has involved the use of "Hot Box" testing in accordance with harmonised National, European and International Standards. Harmonised National, European and International test methods have also now been devised to determine thermal resistance via either a guarded hot plate or heat flow meter.

Despite the three testing methods currently detailed in harmonised standards other manufacturers feel that these tests do not fully reflect the special characteristics of their products. Accordingly, new individual test methods involving comparisons (using test rigs or actual buildings) between their own product and another insulating product (usually mineral wool) continue to be developed.

Such tests set out to demonstrate that the actual energy consumption of buildings using multi-foil insulation will be equivalent to (or better than) an identical building using mineral wool insulation, and having done so, claim the same "R" value for the multi-foil product as would be accepted for the test thickness of mineral wool.

There is currently no harmonised National, European or International standard available in respect of comparative testing. Members should be aware that Circular 06/2007 issued by DCLG after the Judicial Review judgement was released stated that "The Department is currently of the view, based both on international scientific opinion and on scientific evidence commissioned and published by it, that comparative testing does not provide accurate indications of thermal performance."

## Is there a big difference in claimed performance?

Tests carried out by the National Physical Laboratory (who have UKAS accreditation) using test methods in accordance with BS EN ISO 8990 (Hot Box Apparatus) have indicated an “R” value for multi-foil products in a range of 1.69 to 1.71 m<sup>2</sup>K/W. Those manufacturers who use comparative testing are, however, claiming “R” values for their products which range from 5 to 6 m<sup>2</sup>K/W. In other words, multi-foil manufacturers who have used the comparative testing route are claiming the insulating properties of their product to be approximately three times better than can be verified using existing National, European or International test standards.

## Do Multi-foils comply with regulation 7?

Regulation 7 (Materials and Workmanship) is a generic Regulation which establishes baseline performance standards applicable to all building materials. Section 1 of the Approved Document to support Regulation 7 then goes on to give advice to Building Control Bodies as to how the fitness of materials can be demonstrated.

A key point here, however, is that other requirements of the Building Regulations may impose specific requirements on particular construction elements (such as walls, floors, roof), and Part L is a good example of this. In such circumstances, it is not enough for example that a particular type of insulation product is “fit for purpose” (the regulation 7 requirement), it is also necessary that the element of which it forms part achieves a particular standard of insulation (the Part L requirement).

## Do things change as a result of BS EN 16012:2012 being published?

BS EN 16012:2012 supports the existing harmonised standards referred to above by describing a set of procedures to follow when using the existing standards. It does not introduce any new procedures for the determination of thermal performance. The standard provides clarity on the appropriate harmonised standard to follow relative to the specific product type. For example many “traditional” type multi-foil products are described in the standard as product Type 1 which should have the core thermal resistance tested in accordance with either Method A (Guarded Hot Plate Apparatus) or Method B (Heat Flow Meter Apparatus). BS EN 16012:2012 does not contain any reference to comparative test methods.

## On Site Installation of Multi-Foil Insulation

With BS EN 16012:2012 indicating either the Hot Plate or Heat Flow Meter as the appropriate method of testing the thermal resistance of a traditional multi-foil product it is critical that these products are correctly installed on site, following individual manufacturer’s guidelines, to achieve the performance values calculated. This will normally involve ensuring that the air space utilised in the u value calculation is maintained on either side of the product together with ensuring that the thickness of the product is also not compromised, especially adjacent to fixing points.

## Guidance

The advice of the BCA technical working group is as follows-

- Building Control Bodies remain entitled to make their own judgement about compliance with the regulations, based on their assessment of any information they consider relevant.
- The group remain of the opinion that the thermal performance of all insulation materials should be determined by testing to National, European or International standards by organisations which have been accredited to do so. On this basis we are not aware of any multi-foil product currently on the market that can meet the normal roof U Value requirement of 0.18 when used as a single layer without the need for additional insulation.
- While the group supports the work of test houses exploring the viability of alternative test methods, our advice to Members remains that they should only accept products which have been tested in accordance with a harmonised National, European or International standard and we are currently unaware of a harmonised standard in respect of comparative testing.
- Several multi-foil manufacturers have now obtained Agreement Board certificates and/or other third party accreditation, and we understand that as part of the assessment process, the thermal performance of

these products has been determined against existing National and European standards. We would therefore consider the use of these products to be acceptable, providing that they are used strictly in accordance with the manner described on the certificate.

- We would advise all Members to review their policy in the light of the publication of BS EN 16012:2012 which provides clarity on the appropriate harmonised test methods available.
- This guidance note will be reviewed regularly by the Technical Working Group, and will be revised whenever the group feels that it is appropriate to do so as a result of new or updated information concerning the use of multi-foil products becoming available.