CEN WS36 Business Plan for a CEN Workshop
Evaluation of Thin Multilayer Reflective Insulation Products
by in situ Testing

1. Status of this Business Plan
Adopted by Workshop Kick-Off meeting

2. Background to the CEN Workshop
Thermal insulation is an important element of the worldwide activities for
the conservation of energy and of special interest is the thermal
insulation of buildings. Examples of this interest in Europe are the
Directive 2006/32/EC on Energy End-user Efficiency and Energy
Services, the supporting CEN Workshop 27 ‘Lifetimes in Energy
Efficiency Calculations’ and the CEN/CENELEC Joint Working Group of
the Technical Boards, concerning Energy Management.

Over the last decade a range of innovative insulation materials have
been produced to complement the longstanding range of thick
homogeneous insulation products. This Workshop covers the thermal
evaluation of one specific type of these new materials, namely thin
multilayer reflective insulation products.

“Conventional” thermal insulation materials have been assessed by rules
given in their product standards developed by CEN/TC 88 using methods
developed in CEN/TC 89, and their declared values are assessed as a
90% fractile value to a 90% statistical confidence limit. The Workshop
Agreement to be produced should aim to achieve the same level of
confidence in the declared value determined by the proposed method.

The evaluation of the thermal reflective performance and specification of
these new insulation products is an essential element in their assessment
and comparison with performance of conventional insulation materials.
However there is a need to agree upon tests which fully evaluate their
thermal characteristics. It is considered that testing, as proposed for
inclusion in the CWA, should fully cover their thermal insulation
characteristics.

The use of differing insulation products is to provide, until the direct
results of the tests are formally accepted, a link, for calibration purposes,
to the conventional methods used for traditional insulation materials.
Thus the use of a conventional insulation product may be considered as
an optional element.

Tests carried out in real conditions of use are performed in many branches of industry throughout the world. The proposers consider that the use of *in situ* testing for these new insulation products provides an effective and realistic measure of their thermal efficiency.

The intention of the multifoil proposers is that the resulting Workshop Agreement will be submitted to the appropriate CEN TC and/or EOTA for consideration as the basis for a future European Standard (EN) or CUAP in support of the Construction Products Directive.

The primary purpose of this CWA is to demonstrate that *in situ* testing of structures incorporating thin multilayer reflective insulation products is a viable method for evaluating the thermal characteristics of these products. The limitation to a specific range of thin multilayer reflective insulation products is solely intended to speed the work of producing the CWA to cover in the first instant those forms of thin multilayer reflective insulation products.

Additionally the limitation to the range of products is to shorten the work involved in Round Robin Tests. As soon as the test method has been agreed then it is the hope of the proposers that the Round Robin Tests will be applied to other forms of thin multilayer reflective insulation products.

“Multifoil insulating products” are defined for the purpose of the present Workshop as products comprising several inter-linked metallic or polymeric films (a minimum of three) covered by reflective surfaces separated by multiple layers of synthetic vegetable or animal wadding or synthetic foam or polymeric bubbles.

### 3 Workshop Proposers

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### 4 Objectives of the CEN Workshop

The overall objective of the Workshop is to reach consensus on an *in situ* test protocol that assess as fully as possible the thermal performance of thin multi-layer reflective insulating products. For the purposes of the Workshop and the resulting CWA the thin multi-layer reflective insulating products to be considered shall have a minimum of five layers.
The method of test to be studied by this Workshop will permit, the performance of test structures to be determined and to establish a link with the conventional methods of measurements and associated calculations.

The method of test permits also the determination of the thermal characteristics of the insulation products used, by means of the simultaneous use of a number of identical test structures. Moreover the use of specific test conditions will ensure, with all criteria being the same (construction, orientation, interior and external conditions of test, air tightness, finishing elements etc) that the only difference between the test structures is the type of insulation product used.

The analysis of the test results will then permit:

- the energy saved to be quantified with each insulation product tested compared with the results from the test structure without insulation;

- the establishment of a link with the results obtained in a laboratory with the conventional methods of measurement (in steady state conditions) in order to make a correlation with the declared values of the traditional homogenous insulation product used during the test and then to establish a link with the declared values of the thin multi-layer reflective insulation product tested and then establish a declared value for it.

The individual objectives of the Workshop are to reach consensus on:

- which thermal characteristics should be measured;
  – a set of requirements, including form, materials, construction, dimensions internal volumes and tolerances, including air tightness, for an enclosed structure representing a roofed building envelope which will be subject to periods of testing under normal climatic conditions by outdoor exposure;
  – a set of conditions under which the structure will be operated, including the location and positioning of structures, type of heat (energy) input and rate of heating within the structure, internal air temperature and relative humidity, in order to measure the thermal performance of the building envelope in both winter and summer periods;
  – a set of conditions for the installation of insulation products inside the envelope structure,;
  – a set of conditions for the measurement of the energy used during the test periods, including the position, number and specification of sensors;
  – the type and choice of sensors, including for temperature measurement and heat-flow measurement, details of the frequency of measurements to be undertaken using these sensors, especially to take into account the dynamic conditions the test structure is being subjected to;
  – a set of conditions for the measurement and recording of the external climatic conditions at the time of the tests and any limitations on acceptable conditions;
– a set of conditions for the analysis of the results of parallel and identical test structures fitted with conventional insulating materials evaluated under conventional test methods and thin multi-layer reflective insulating products;
– a set of principles for the reporting of the results, which will include accuracy and reproducibility, and an agreed way of deriving and expression of the declared thermal performance of the thermal insulation product which should aim to achieve a similar level of confidence as that achieved with steady state test methods;
– a set of conditions including accuracy and reproducibility, for the use of modelling to transpose the results of the \textit{in situ} tests to the expression of possible performances of the multi-layer reflective insulation products in other climatic conditions or other time periods.

5 CEN Workshop Programme

The Kick-Off meeting is intended to confirm the Workshop’s Business Plan and organizational structure such as Secretariat, Chair, resource requirements, as well as the programme of work and other matters identified in this Workshop Business Plan.

The Kick-Off meeting will be held during October 2007 in Brussels. Three meetings of the Workshop are foreseen for the creation of the CWA. The Workshop shall operate in English. Documents and correspondence with the Secretariat shall be in English, and any translations to be provided, where necessary, by and at the cost of the participants.

The first meeting of the Workshop is intended for the presentation of the proposals for test requirements, test results and relevant documentation. The aim is to agree on the basic requirements amongst the confirmed Registered Participants.

The second Workshop meeting is foreseen to discuss the text of the draft CWA, in order that the draft can be made ready for distribution for comment to Registered Participants. The period for comment shall be determined at the Kick-Off meeting.

Comments received are to be processed by the Workshop Secretariat and distributed to the Registered Participants.

A third meeting of the Workshop will be held to consider the comments received and agree on any modifications to be made to the CWA. The proposed period from the Kick-Off meeting to the meeting at which the CWA will be decided is twelve months (subject to endorsement at the Kick-Off meeting). The CWA shall then be processed for publication in English.

Following on from the meeting at which the finalised CWA is agreed a series of
Round Robin tests will be started by registered participants, using the test protocol defined in the CWA, for periods to be determined by the Workshop but overall for a period of between twelve and eighteen months (subject to endorsement at the Kick-Off meeting).

A fourth meeting of the Workshop is therefore envisaged to overview the results of the use of the CWA, to assess the results of the Round Robin Tests and to decide any changes that may be necessary to the CWA.

A separate Working Group is foreseen, subject to endorsement at the Kick-Off meeting, to agree upon the requirements for an electronic simulation tool that can produce results to an agreed minimum accuracy of that of the full in situ tests. The Working Group should be created at the time of the Kick-Off meeting and will comprise a Convenor and members of bodies intended to become Registered Participants. The Working Group is to finalise its work in time for the results to be submitted for endorsement at the meeting of the Workshop to decide on the finalised CWA. The adopted results will form an Annex to the CWA.

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<thead>
<tr>
<th>Date</th>
<th>Meeting</th>
<th>Events</th>
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<tr>
<td>October 2007</td>
<td>Kick-Off</td>
<td>Approval of BP, appointment of Chair and Secretariat, organization of WG.</td>
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<tr>
<td>November 2007</td>
<td>First Plenary</td>
<td>Presentation of the proposals for test requirements, test results and relevant documentation</td>
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<td>Second Plenary</td>
<td>Endorsement of draft CWA, for distribution for comment to Registered Participants.</td>
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<tr>
<td>Before Oct. 2008</td>
<td>Third Plenary</td>
<td>Consideration of comments received from participants and final agreement CWA.</td>
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<tr>
<td>Between Oct. 2009 and April 2010</td>
<td>Fourth Plenary</td>
<td>Overview of results of the use of the CWA, to assess the results of the Round Robin Tests and to decide any changes that may be necessary to the CWA.</td>
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6 CEN Workshop Organisation

ELOT the Greek CEN member, will provide the Workshop Secretariat, subject to the endorsement of the Kick-Off meeting [and the necessary Service Level Agreement with CEN Management Centre]. The Secretariat will provide practical support to the Workshop by organizing the meetings, distributing documents and the writing of minutes and the editing of final documents. All communications between meetings will be carried out electronically.

The Proposers nominated Mr Ludovic Lauwers as Workshop Chair, and will provide draft documents and expert technical advice.

The CEN Workshop will operate within its terms of reference as agreed at the Kick-Off meeting and as described in the related CEN regulations and decisions. See the CEN Website www.cen.eu/boss.

7 CEN Workshop Resources

The expected requirements are:
- Chair: supported by Proposers;
- Secretariat: supported by Proposers;
- Registered Workshop participants: voluntary participation
- Convenor of Working Group: supported by Proposers.

All costs related to the attendance and participation of interested parties in the Workshop’s activities, including travel, hotel and meals, are to be borne by the participants.

Funding for the administration of the Workshop shall be provided from fees charged to the Registered Participants of the Workshop. An initial fee of 1,000 € per company or organization will be charged, based on the programme of work as agreed at the Kick-Off meeting and may be later supplemented dependent on agreed changes to the Work Programme subject to consensus agreement by the Registered Participants.

8 Related Activities

The Workshop will liaise with CEN/TC 89 “Thermal performance of buildings and building components” and in particular its WG12, and the European Organisation for Technical Approval (EOTA).

Both CEN/TC 89 and EOTA have made studies on reflective insulation products. However EOTA has decided to suspend its study of in situ testing and to maintain reliance on the existing "Hot Box" or "Hot Plate" test methods. CEN/TC 89/WG12 has embarked on a wide ranging study of insulation products having a reflective surface, or surfaces. Whilst WG 12 will include a review of in situ testing it has made no commitment to produce an EN on in situ testing of thin multilayer reflective insulation products. At the present the only test methods recommended by CEN/TC 89 are the existing “Hot Box" or "Hot Plate"
test methods.

Liaison should be made by the Workshop with CEN/TC 89 in order to facilitate the possibility that the CWA can be progressed towards establishing formal recognition of its contents as an EN as a means of evaluating thin multilayer reflective insulation products as defined in the CWA in accordance with the EU Construction Products Directive.

9 Contact Points

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