BS EN 14064-2:2010

BSI Standards Publication

Thermal insulation products for buildings — In-situ formed loose-fill mineral wool (MW) products

Part 2: Specification for the installed products

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National foreword

This British Standard is the UK implementation of EN 14064-2:2010.

The UK participation in its preparation was entrusted to Technical Committee B/540/6, Fibrous and inorganic thermal insulation materials.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Produits isolants thermiques pour le bâtiment - Isolation thermique formée sur chantier à base de laine minérale (MW) - Partie 2 : Spécification des produits installés

Wärmedämmstoffe für Gebäude - An der Verwendungsstelle hergestellte Wärmedämmung aus Mineralwolle (MW) - Teil 2: Spezifikation für die eingebauten Produkte

This European Standard was approved by CEN on 9 January 2010.

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Foreword

This document (EN 14064-2:2010) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2010, and conflicting national standards shall be withdrawn at the latest by August 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

EN 14064, *Thermal insulation products for buildings — In-situ formed loose-fill mineral wool (MW) products*, consists of two parts which form a package. The first part, which is the harmonised part satisfying the mandate, the CPD and is the basis for the CE marking, covers the products, which are placed on the market. The second part (this European Standard), which is the non-harmonised part, covers the specification for the installed products.

Part 1 of EN 14064 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

Attention is drawn to the need to take into account any complementary Member State rules (e.g. installation rules) which together with this European Standard ensures the fitness for purpose of the installed product.

This European Standard contains five annexes:

— Annex A (normative) Lofts – Determination of installed insulation thickness – Pin and plate method

— Annex B (normative) Masonry cavity walls – Determination of average cavity width

— Annex C (normative) Masonry cavity walls and frame constructions – Coverage test box

— Annex D (normative) Masonry cavity walls – Use of endoscope to check adequacy of fill

— Annex E (normative) Guidance for the installer – Suitability of the building, training, pre-checks and installation declaration

This European Standard is one of a series for mineral wool, expanded clay, expanded perlite, exfoliated vermiculite, polyurethane/polyisocyanurate, cellulose and bound expanded polystyrene in-situ formed insulation products used in buildings, but this standard may be used in other areas where appropriate.

The reduction in energy used and emissions produced during the installed life of insulation products exceeds by far the energy used and emissions made during the production and disposal processes.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies the requirements for blown loose-fill mineral wool products installed in lofts, masonry cavity walls and frame constructions.

This European standard is a specification for the installed insulation products.

This European standard describes, when taken together with Part 1 of EN 14064, the product characteristics that are linked to the essential requirements of the EU Construction Products Directive. It also specifies the checks and tests to be used for the declarations made by the installer of the product and the rules for the evaluation of conformity.

This standard does not specify the required level of a given property to be achieved by a product to demonstrate fitness for purpose in a particular application. The levels required for a given application are to be found in regulations or non-conflicting standards. For example, see the note in the scope of Part 1 of EN 14064 regarding the possibility of special water penetration tests in different Member States.

Products with a declared thermal conductivity at 10 °C greater than 0,060 W/(m·K) are not covered by this standard.

This European Standard does not cover factory made mineral wool products in the form of mats, batts, rolls or boards.

This standard does not cover products intended for airborne sound insulation and for acoustic absorption applications.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14064-1:2010, *Thermal insulation products for buildings — In-situ formed loose-fill mineral wool (MW) products — Part 1: Specification for the loose-fill products before installation*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
mineral wool
insulation material having a woolly consistency, manufactured from molten rock, slag or glass

[EN ISO 9229:2007]

3.1.2
installed declared insulation thickness
insulation thickness as installed by the installer, prior to any settlement

3.1.3
frame construction
walls with wood or metal studs, sloping roof with insulation between rafters

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3.1.4
settlement
decrease of installed insulation thickness in lofts or height in cavities and frame constructions with time, expressed as a percentage of the initial installed thickness

3.1.5
installed declared coverage
mass of insulation per unit area

3.1.6
performance chart
table giving thickness and coverage requirements for different values of declared thermal resistance

3.1.7
system
particular type of loose fill mineral wool insulation used in conjunction with a defined blowing machine with a blowing hose and defined nozzle

3.1.8
blowing hole
hole, cut or formed, in a masonry cavity wall or frame construction, through which the mineral wool is blown

3.2 Symbols and abbreviations

Symbols used in this standard:

d	is the installed declared insulation thickness	mm
λ_i	is one test result of thermal conductivity	W/(m·K)
λ_D	is the declared thermal conductivity	W/(m·K)
R	is the thermal resistance	m^2·K/W
R_D	is the installed declared thermal resistance	m^2·K/W
s	is the relative reduction in thickness, due to settlement	%
W_p	is the short term water absorption	kg/m^2
S	is the symbol of the declared class for settlement	

Abbreviations used in this standard:

MW **M**ineral **W**ool

4 Requirements

4.1 General

The installer shall use an insulation product that complies with EN 14064-1 in a system appropriate to the application.

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4.2 Suitability of the building for the installation of the product

The installer shall inspect the building in accordance with manufacturer's guidelines and national regulations, in order to determine whether it is suitable for application of the product. Typical checklist is given in Annex E.

4.3 In-situ measurements and calculations

4.3.1 General

Properties of the installed product shall be assessed in accordance with Clause 5. To comply with this standard, products shall meet the requirements of 4.3.2, and the requirements of 4.3.3 as appropriate.

One test result on a product property is the average of the measured values on the number of test specimens given in Table 1.

The declared thermal resistance level is for the insulation only, disregarding the effects of studs, beams, rafters, etc.

NOTE 1 EN ISO 10456 describes how the design thermal conductivity is calculated from the declared thermal conductivity.

NOTE 2 For calculating the thermal resistance of complete building elements involving the use of these products the procedures given in EN ISO 6946 can be used.

4.3.2 The installed declared thermal resistance of loft insulation

Thermal resistance shall be assessed by the procedure given in 5.2.2:

The mean value for the installed declared insulation thickness shall not be less than the minimum value given by the manufacturer's performance chart. No individual thickness value shall be less than a value which is 30 mm lower than the minimum installed thickness of the performance chart.

The installed number of bags and the installed coverage shall not be less than the minimum given by the performance chart.

In case of dispute, the frame method according to 5.2.2.4 and the thickness test method of Annex A shall be used to determine thickness and installed declared coverage.

The thermal resistance level for the installed insulation shall be declared in accordance with the performance chart given by the manufacturer.

NOTE Annex I (normative) of EN 14064-1:2010 gives guidance for creating performance charts and examples of performance charts.

4.3.3 The installed declared thermal resistance of masonry cavity wall and frame construction insulation

Thermal resistance shall be assessed by means of the procedure given in 5.2.3.

The number of bags installed shall not be less than the minimum number stated in the manufacturer's performance chart.

The thermal resistance level for the installed insulation shall be declared in accordance with the performance chart given by the manufacturer.

NOTE Annex I (normative) of EN 14064-1:2010 gives guidance for creating performance charts and examples of performance charts.

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The installed declared thermal resistance can also be calculated using the formula:

$$R_{\mathrm{D}} = d \cdot \frac{1}{\lambda_{\mathrm{D}}} \qquad (1)$$

where

R_D is the installed declared thermal resistance, in square metre·Kelvins per watt (m^2·K/W);

d is the cavity/frame width, in metres (m);

λ_{D} is the declared thermal conductivity, in watts per metre·Kelvin (W/(m·K)).

The value of the thermal resistance level shall be rounded downward to the nearest 0,05 m^2·K/W and declared in steps of 0,05 m^2·K/W.

5 Test methods

5.1 Conditioning

No special conditioning of the test specimens is needed unless otherwise specified in the test standards. In case of dispute, the test specimens shall be stored at (23 ± 2) °C and (50 ± 5) % relative humidity for at least 6 h prior to testing.

5.2 Testing

5.2.1 General

Table 1 gives the dimensions of the test specimens, the minimum number of test specimens required to get one test result and any specific conditions which are necessary.

Table 1 — Test methods, test specimens and conditions

Clause	Title	Test method	Test specimen		Specific conditions
			Dimensions mm	Number to get one test result	
4.2	Thermal resistance of installed loft insulation	5.2.2.2 to 5.2.2.4	—	10 per 100 m^2	Thickness and number of bags
			≥ 0,12 m^2	1	Frame method in case of dispute
4.3	Thermal resistance of cavity wall and frame construction insulation	5.2.3.2 to 5.2.3.4	—	10 per 100 m^2	Cavity width and number of bags
			≥ 0,5 m × 0,5 m × 0,06 m		In case of dispute

5.2.2 Installed declared thermal resistance of loft insulation

5.2.2.1 General

Installed declared thermal resistance shall be assessed by measurement of:

a) installed declared insulation thickness according to 5.2.2.2;

b) installed number of bags and installed declared coverage according to 5.2.2.3.

In case of dispute, the frame method according to 5.2.2.4 shall be used.

5.2.2.2 Installed declared insulation thickness

At least ten thickness measurements in different places shall be made for each 100 m^2 of loft area. A pin or ruler graduated in millimetres or markers on the construction shall normally be used for these measurements.

In case of dispute the thickness shall be measured with the pin and plate method in accordance with Table 3 and Annex A.

5.2.2.3 Installed declared coverage

The installed coverage shall be calculated by dividing the total weight of product installed by the area of the installation. The total weight of the product shall be obtained from the number of bags used.

In case of dispute the installed coverage shall be determined according to 5.2.2.4.

5.2.2.4 Frame method for the determination of installed declared coverage

A circular frame with an area of at least 0,12 m^2 shall be carefully pressed through the insulation after installation. The insulation material inside the frame shall be taken out as a specimen and weighed. The installed declared coverage shall be calculated as the mass of the specimen divided by the area of the frame.

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5.2.3 Thermal resistance of installed masonry cavity wall and frame construction insulation

5.2.3.1 General

Thermal resistance shall be assessed by measurement of:

a) average cavity width according to 5.2.3.2;

b) machine output according to 5.2.3.3;

c) installed coverage according to 5.2.3.4.

5.2.3.2 Average cavity width

The average width of the cavity shall be measured in accordance with the method given in Annex B through at least ten blowing holes per 100 m^2.

5.2.3.3 Machine output

The blowing machine shall be set in accordance with the insulation product manufacturer's instructions. The machine output shall be adjusted to fill the test box to the coverage value specified by the manufacturer in accordance with Annex C.

5.2.3.4 Installed coverage

The installed coverage shall be calculated from the number of bags used and the area of wall filled.

In case of disputes either of the following procedures shall be used:

a) The adequacy of fill can be determined using an endoscope in accordance with Annex D;

b) A section of masonry wall approximately 0,5 m $\times$ 0,5 m can be removed, the insulation removed and weighed. The coverage of the product can be calculated from the weight of the mineral wool and the dimensions of the area where the specimen was removed. The coverage shall not be less than 85 % of the minimum value declared by the manufacturer.

6 Guidelines for installation

National Practice or Local Rules and Manufacturer's instructions shall be followed.

7 Installer's declaration

The installer shall declare to the customer that the work has been carried out in accordance with the requirements of this standard using an insulation product that complies with EN 14064-1.

The installer shall also state at least the following information:

a) trade name and designation code for the installed product;

b) number of EC certificate of conformity for the insulation product, if applicable;

c) installed declared thermal resistance values in accordance with 4.3.2 and/or 4.3.3 whichever is applicable;

d) installed declared insulation thickness in accordance with Clause 5;

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e) installed declared insulation coverage in accordance with Clause 5;

f) the quantity of insulation used for the installation (number of bags or kilograms (kg));

g) the place and date of installation.

NOTE Further information may be declared as in the examples given in Annex E.

Annex A
(normative)

Lofts – Determination of installed insulation thickness – Pin and plate method

A.1 Apparatus

The measuring equipment consists of a pressure plate, a pin and a metal rule.

A pressure plate made from a transparent rigid plastic or other suitable material, 200 mm square and fitted with a suitable thumb grip. The total mass of the plate and the grip shall be within the range 75 g to 88 g so that it exerts a pressure of (20 ± 1,5) Pa (see Figure A.1).

A pin made from 3 mm diameter of steel rod and of sufficient length to penetrate the full thickness, *d*, of the insulation layer (see Figure A.2), with 20 mm of one end sharpened to a point.

A metal rule graduated in millimetres to permit readings to 1,0 mm.

A.2 Procedure

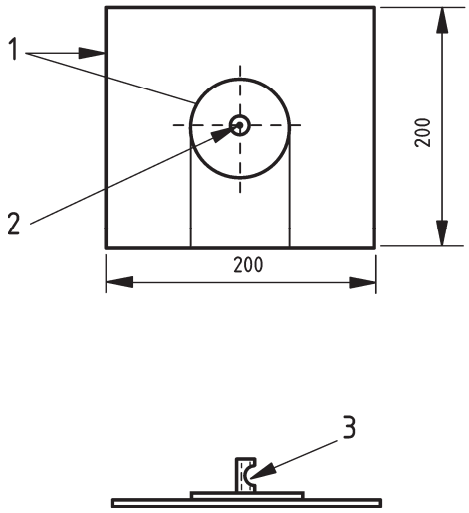
Place the pressure plate on the designated measuring point, lowering it slowly, exerting a total pressure of (20 ± 1,5) Pa.

Force the pin with a rotary motion vertically downward through the insulation layer to the surface below.

Grasp the pin firmly at the thumb grip and remove both the pin and the plate. Measure the distance from the point of the pin to the plate. This distance is the thickness of the insulation layer at this point.

NOTE This pin and plate is similar to the one described in EN 823:1994, *Thermal insulating products for building applications – Determination of thickness*. The difference is that this standard uses a plate pressure of 20 Pa instead of 50 Pa.

Dimensions in millimetres

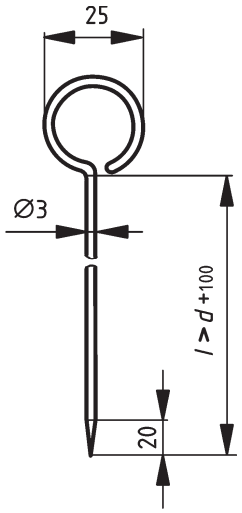


Key

1 Rigid plate
2 Hole with diameter suitable for sliding pin perpendicular to plate
3 Thumb grip

Figure A.1 — Pressure plate

Dimensions in millimetres



Key

d Full thickness of the insulation layer
l Length of the pin

Figure A.2 — Pin

Annex B
(normative)

Masonry cavity walls – Determination of average cavity width

B.1 Procedure

Measure the cavity width through the holes drilled to install the insulation product.

For each hole measure, by inserting a steel tape rule or similar zero ended rule until it touches the inner leaf, the total width of the cavity and outer leaf to the nearest 1 mm. In each case determine the width of the cavity by deducting the thickness of the outer leaf.

Measure the cavity width for each of ten holes for each 100 m^2 of cavity area. Ensure that the holes measured are evenly distributed over the total area of the wall.

B.2 Calculation

Calculate the average cavity width as the average of the individual measurements of cavity width.

Annex C
(normative)

Masonry cavity walls and frame constructions – Coverage test box

C.1 Apparatus

The apparatus shall consist of a vertical square timber box having a minimum side length of 500 mm and with an internal minimum cavity width of 60 mm. Ventilation holes (25 ± 2) mm in diameter shall be inserted in each side not less than 100 mm apart. One blowhole shall be positioned in the centre of one face of the box.

C.2 Procedure

a) Blow the insulation material into the test box using the blowing machine set to the manufacturer's instructions.

b) Inspect the blown insulation material to ensure that the box is completely filled. In addition check that there are no voids in the insulation. If either of these conditions is not satisfied, clear out the box, alter the machine settings and repeat the procedure.

c) Record the time taken to fill the test box and the mass of material used.

d) Calculate the test box coverage and flow rate.

e) Compare the test box coverage and flow rate with values declared by the manufacturer. If either of the values does not fall within the tolerance of the declared value, alter the machine settings and repeat the procedure.

Annex D
(normative)

Masonry cavity walls – Use of endoscope to check adequacy of fill

D.1 Selection of inspection positions by the inspector

Inspection positions shall be chosen by taking into consideration:

a) the installed drilling pattern;

b) the features of the building.

A minimum of two holes per elevation shall be drilled for endoscope inspection of the installation cavity fill.

D.2 Action to be taken by the inspector

Initially the inspector shall determine if the pattern is correct or not. If the drilling pattern is correct, the inspection holes shall be drilled between the drilling points.

If the drilling pattern is wrong, the inspector would use his knowledge of building design and his expertise in the installation of cavity fill to decide where the inspection holes shall be placed to test the adequacy of fill.

If the fill is found to be inadequate the area(s) shall be noted and the installing company instructed to return to ensure an adequate fill by using an adjusted drilling pattern to compensate for the problems found.

Annex E
(normative)

Guidance for the installer − Suitability of the building, training, pre-checks and installation declaration

E.1 Lofts

E.1.1 Suitability of the building to receive the insulation product

Before installing the insulation product the installer shall look for obvious defects of the loft. Any defects found shall be corrected before filling takes place. The following list can be used:

a) The roof and ceiling construction shall be finished. There shall be no risk of rain or snow coming into the insulation through the roof construction.

b) The loft area shall have ventilation. The construction shall prevent out-door air from entering the insulation.

c) There shall be access arrangements to all parts of the loft that might need attention after the installation of the insulation product.

d) Arrangements shall have been made to prevent the insulation from reaching parts of the loft not intended to be insulated, e.g. chimneys, flues and recess light fittings.

e) Water pipes, ventilation ducts and storage tanks shall be insulated to prevent condensation and freezing.

E.1.2 Control tests made by the installer when preparing the product on site

The installer shall find the machine setting that will give a result fulfilling the requirements of this standard.

One way of doing this is to insulate a small part of the loft and then make the necessary measurements and calculation for the insulated part. If necessary the procedure is repeated until a suitable machine setting has been found.

E.1.3 Installation procedure

The installer shall be trained in accordance with the guidelines given by the manufacturer or the system supplier.

E.1.4 Installer's declaration

Clause 6 gives the information to be declared by the installer. The operator keeps all the labelling for all bags used. He staples the labelling with a copy of the construction site document The declaration below is an example giving more information.

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The installation contractor:
Company name and address
Name of operator

The insulation product:
Trade name
Manufacturer's production code
Type of product
Product standard
Bag weight (kg)
Designation code

The installation site:
Address
Type of building

The installation:
Insulated area (m^2)
Installed insulation thickness (mm)
Expected thickness, after settlement (mm)
Declared thermal resistance level ($m^2 \cdot K/W$)
Minimum number of bags
Minimum coverage (kg/m^2)
Installed number of bags
Installed coverage (kg/m^2)
Type of blowing machine and machine setting

Date of installation:
Operator's signature:

E.2 Masonry cavity walls

E.2.1 Suitability of the building to receive the insulation

When assessing the suitability of cavity walls for filling with mineral wool the following factors shall be considered:

a) form of construction and site conditions;

b) condition of the cavity;

c) extent of cavity to be filled;

d) nature and condition of the outer leaf;

e) nature and condition of the inner leaf;

f) services within the cavity;

g) ventilation through the cavity.

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All flues to combustion appliances passing through, or adjacent to, the cavity walls shall be tested in accordance with national regulations.

It is also necessary to ensure that:

1) Where the cavity is used as a source of combustion air or as a means of ventilation (e.g. in timber structures, for suspended timber floors or flat roofs) or wrongly used as a flue, a suitable trunking or other device is installed to maintain adequate air or flue gas flow;

2) Air-bricks that ventilate a subfloor, room, loft, etc., or that provide combustion air, if not adequately sleeved shall be trunked to prevent blockage by insulation;

3) Open cavity heads shall be closed. Where roof ventilation depends upon an open cavity, alternative arrangements for ensuring adequate ventilation shall be made;

4) Holes in the inner leaf of the wall shall be closed or sealed where necessary to minimise escape of insulation.

E.2.2 Control tests made by the installer when preparing the product on site

The installer shall find the machine setting that will give a result fulfilling the requirements of this standard.

Use the procedure described in Annex D (normative). If necessary the procedure is repeated until a suitable machine setting has been found.

E.2.3 Installation procedure

The installer shall be trained in accordance with the guidelines given by the manufacturer or the system supplier.

E.2.4 An example of a declaration form for use by the installer

The installation:
Company name and address…….
Name of operator……..

The insulation product:
Trade name ……..
Manufacturer's production code……
Type of product …….
Product standard ……..
Bag weight (kg) …….
Designation code ……..

The installation site:
Address ……
Type of building……

The installation:
Insulated area (m^2) …….
Mean cavity width (mm) ……..
Number of bags used …….
Average installed insulation density (kg/m^3) ……..
Declared thermal resistance level ($m^2 \cdot K/W$) ……..

Date of installation: …….
Operator's signature: …….

E.3 Frame constructions

E.3.1 Suitability of the building to receive the insulation

For new constructions it is advisable to insulate the frame construction before the mounting of the inner leaf, provided that the inner part of the frame is covered by a transparent foil, e.g. a vapour barrier, that will hold the insulation in place. Then the construction is easy to inspect and the filling of the frame can be monitored through the foil.

When assessing the suitability of the frame constructions the following factors should be considered. Some of them depend on whether the inner leaf has been mounted or not:

a) form of construction and site conditions;

b) condition of the frame;

c) extent of the frame, e.g. thickness;

d) nature and condition of the outer leaf;

e) nature and condition of the inner leaf;

f) nature and application of the inner leaf;

g) ventilation of the frame construction.

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It is also important to ensure the following:

h) Where there is a need for ventilation of the structure a suitable trunking or other device is installed to maintain adequate airflow;

i) Holes in the inner or outer leaf are sealed to minimise escape of insulation;

j) The quality of the workmanship is checked before mounting the inner leaf.

E.3.2 Control tests made by the installer when preparing the product on site

The installer shall find the machine setting that will give a result fulfilling the requirements of this standard.

Use the procedure described in Annex D (normative). If necessary the procedure shall be repeated until a suitable machine setting has been found.

E.3.3 Installation procedure

The installer shall be trained in accordance with the guidelines given by the manufacturer or the system supplier.

E.3.4 An example of a declaration form for use by the installer

The installation:
Company name and address…….
Name of operator……..

The insulation product:
Trade name ……..
Manufacturer's production code…….
Type of product …….
Product standard ……..
Bag weight (kg) …….
Designation code ……..
Number of EC certificate of
conformity for the insulation product ……..

The installation site:
Address …….
Type of building
Inspectable/Not Inspectable

The installation:
Insulated area (m^2) …….
Mean thickness (mm) ……..
Number of bags used ……..
Minimum Declared thermal resistance level ($m^2 \cdot K/W$)

Date of installation: …….
Operator's signature: …….

Bibliography

[1] EN ISO 9229:2007, *Thermal insulation — Vocabulary (ISO 9229:2007)*

[2] EN 823:1994, *Thermal insulating products for building applications — Determination of thickness*

[3] EN ISO 6946, *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method (ISO 6946:2007)*

[4] EN ISO 10456, *Building materials and products — Hygrothermal properties —Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007)*

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