BS EN 14064-1:2010

BSI Standards Publication

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

Part 1: Specification for the loose-fill products before installation

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 14064-1:2010.

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.

ISBN 978 0 580 54929 8

ICS 91.100.60

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2010.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14064-1

February 2010

ICS 91.100.60

English Version

Thermal insulation products for buildings - In-situ formed loose-fill mineral wool (MW) products - Part 1: Specification for the loose-fill products before installation

Produits isolants thermiques pour le bâtiment - Isolation thermique formée sur chantier à base de laine minérale (MW) - Partie 1 : Spécification des produits en vrac avant l'installation

Wärmedämmstoffe für Gebäude - An der Verwendungsstelle hergestellte Wärmedämmung aus Mineralwolle (MW) - Teil 1: Spezifikation für Schüttdämmstoffe vor dem Einbau

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

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 14064-1:2010: E

Contents

Page

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Foreword

This document (EN 14064-1:2010) 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 November 2011.

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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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 (this European Standard), 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, which is the non-harmonised part, covers the specification for the installed products. Both parts need to be used for the application of the insulation product in the end-use applications covered by EN 14064.

This European Standard contains thirteen annexes:

— Annex A (normative) Determination of the declared values of thermal resistance and thermal conductivity

— Annex B (normative) Factory production control

— Annex C (normative) Specimen preparation for thermal resistance and thermal conductivity test

— Annex D (normative) Specimen preparation for water absorption test

— Annex E (normative) Specimen preparation for airflow resistivity test

— Annex F (normative) Testing for reaction to fire of products

— Annex G (normative) Testing for reaction to fire of products in standardised assemblies simulating end-use applications

— Annex H (normative) Rules for creating performance charts for loose-fill insulation and examples of performance charts

— Annex I (normative) Verification of performance chart according to Annex H (normative)

— Annex J (normative) Specimen preparation method for coverage measurement

— Annex K (normative) Thermal insulating products for lofts − Determination of settlement for blown loose fill insulation

— Annex L (informative) Masonry cavity walls − Method for determining suitable spacing for blowing holes

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

— Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

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.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

1 Scope

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

This European standard is a specification for the insulation products before installation. It describes the product characteristics and includes procedures for testing, marking and labelling.

This document 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.

NOTE To avoid water penetration in masonry walls special tests adjusted to local climate might be needed.

This document does not cover factory made mineral wool (MW) insulation products or in-situ products intended to be used for the insulation of building equipment and industrial installations.

Products with a declared thermal resistance lower than 0,25 $m^2 \cdot K/W$ or a declared thermal conductivity greater than 0,060 W/(m·K) at 10 °C are not covered by this document.

This document 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 823, *Thermal insulating products for building applications — Determination of thickness*

EN 1609:1996, *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*

EN 12667, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance*

EN 13172:2008, *Thermal insulation products — Evaluation of conformity*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13820, *Thermal insulating materials for building applications — Determination of organic content*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 15715:2009, *Thermal insulation products — Instructions for mounting and fixing for reaction to fire testing — Factory made products*

EN 29053:1993, *Acoustics — Materials for acoustical applications — Determination of air flow resistance (ISO 9053:1991)*

EN ISO 1182, *Reaction to fire tests for building products — Non-combustibility test* (*ISO 1182:2002)*

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

EN ISO 1716, *Reaction to fire tests for building products — Determination of the heat of combustion (ISO 1716:2002)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2:2002)*

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

3.1.2
blowing hole
hole, cut or formed, in a masonry cavity wall or frame construction, through which the mineral wool is blown

3.1.3
class
combination of two levels of the same property between which the performance shall fall

3.1.4
coverage
mass of insulation per unit area

3.1.5
frame construction
walls with wood or metal studs, sloping roof with insulation between rafters

3.1.6
level
given value, which is the upper or lower limit of a requirement, where the level is given by the declared value of the characteristic concerned

3.1.7
performance chart
table giving thickness and coverage requirements for different values of declared thermal resistance

3.1.8
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 or installed height

3.2 Symbols and abbreviations

Symbols used in this document:

$\lambda_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the thermal conductivity	W/(m·K)
λ_D	is the declared thermal conductivity	W/(m·K)
λ_i	is one test result of thermal conductivity	W/(m·K)
λ_{mean}	is the mean thermal conductivity	W/(m·K)

$\lambda(\rho)$	is the curve of thermal conductivity versus density	
a, b, c	are constants used in the formula $\lambda(\rho) = a + b\rho + c/\rho$	
$\rho_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the density	kg/m^3
ρ_l	is one test result of density	kg/m^3
ρ_{mean}	is the mean value of density	kg/m^3
ρ_D	is the declared density	kg/m^3
A	is the area of the test specimen	m²
d	is the thickness of the test specimen	mm
n	is the number of test results	–
$R_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the thermal resistance	m^2·K/W
R_D	is the declared thermal resistance	m^2·K/W
R_i	is one test result of thermal resistance	m^2·K/W
s_λ	is the estimate of the standard deviation of the thermal conductivity	W/(m·K)
s_R	is the estimate of the standard deviation of the thermal resistance	W/(m·K)
s_ρ	is the estimate of the standard deviation of the density	kg/m^3
W_p	is the short-term water absorption	kg/m^2
B_{nom}	is the nominal weight of the bag	kg
AF	is the symbol of the declared level of airflow resistivity	
MU	is the symbol for the declared value for water vapour diffusion resistance factor	
S	is the symbol of the declared class for settlement	
WS	is the symbol of the declared level for short-term water absorption	

Abbreviations used in this document:

MW	**M**ineral **W**ool
ITT	**I**nitial **T**ype **T**est

4 Requirements

4.1 General

Product properties shall be assessed in accordance with Clause 5. To comply with this standard, products shall meet the requirements of 4.2, and the requirements of 4.3 as appropriate.

This document gives performance charts for three different applications:

— loft insulation;

— masonry cavity wall insulation;

— frame insulation.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

One test result on a product property is the average of the measured values on the number of test specimens given in Table 3.

4.2 For all applications

4.2.1 Thermal conductivity − Thermal resistance

Thermal resistance and thermal conductivity shall be based upon measurements carried out in accordance with EN 12667.

The thermal values shall be determined in accordance with Annex A and declared by the manufacturer, according to the following:

— the reference mean temperature shall be 10 °C;

— the measured values shall be expressed with three significant figures;

— if the calculation of the declared thermal conductivity value is based on the curve λ(ρ), this curve shall be determined by the mean of the equation: $a + b\rho + c/\rho$, where a, b and c are constants determined by a non-linear regression analysis;

— the thermal resistance, R_D, shall always be declared. The thermal conductivity, λ_D, shall be declared where possible;

— the thermal resistance, R_D, and the thermal conductivity, λ_D, shall be given as limit values representing at least 90 % of the production determined with a confidence level of 90 %;

— the value of thermal conductivity $\lambda_{90/90}$ shall be rounded upwards to the nearest 0,001 W/(m·K) and declared in levels with steps of 0,001 W/(m·K);

— the declared thermal resistance, R_D, shall be calculated from the insulation thickness and the corresponding thermal conductivity, $\lambda_{90/90}$ (see Note below);

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

NOTE The declaration of the installed thermal resistance for blown mineral wool is described in EN 14064-2.

4.2.2 Weight of the sale unit

The quantity of material in one sale unit shall not be lower than the nominal weight of the sale unit.

4.2.3 Settlement

4.2.3.1 General

The difference between the three applications listed in 4.1 lies in the requirement for settlement. Loft insulation can have any class of settlement, but closed constructions as masonry cavity wall insulation and frame insulation should fulfil the requirements of settlement class S1 unless otherwise specified in non-conflicting application standards or regulations.

4.2.3.2 Lofts

Settlement shall be declared in accordance with Table 1.

The declaration shall be based upon the expected settlement 25 years after installation. The installed insulation shall have been made on constructions similar to those declared by the manufacturer in the performance chart.

The declaration shall be derived from test results from either:

— documented field studies with continuous monitoring of settlement until equilibrium;

or

— documented field studies with continuous monitoring of settlement for at least three years. If the settlement has not reached equilibrium after three years, the three year value is deemed to represent 80 % of the final settlement;

or

— when tested according to the method given Annex K.

If the settlement after the completion of any of the above tests is not measurable (≤ 1 %), settlement class S1 shall be declared.

If the settlement after the completion of any of the above tests is more than 1 % but less or equal to 5 %, settlement class S2 shall be declared.

If settlement after the completion of any of the above tests is more than 5 % but less than or equal to 10 % then settlement class S3 shall be declared.

If settlement after the completion of any of the above tests is more than 10 %, the product does not comply with this standard.

Table 1 — Classes for settlement for lofts application

Class	Requirement
S1	No measurable settlement (≤ 1 %)
S2	> 1% and ≤ 5 %
S3	> 5 % and ≤10 %

4.2.3.3 Walls, masonry walls and frame constructions

As these constructions are difficult or impossible to re-fill, no settlement shall be accepted and only settlement class S1 is accepted.

Documented minimum densities to avoid settlement shall be applied. These densities are related to structure type and climatic conditions and are confirmed either by the relevant authority dealing with the application in the "works".

Alternatively, the minimum densities in Table 2 shall apply.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table 2 – Minimum densities for masonry walls and frame constructions

Product	Masonry Wall	Frame construction	
		Vertical and inclined	Horizontal
Glass Wool	25 kg/m^3	30 kg/m^3	30 kg/m^3
Stone Wool	60 kg/m^3	70 kg/m^3	65 kg/m^3

NOTE Test methods to determine the settlements in masonry walls and frame constructions are currently under investigation and therefore when a test method is available this European Standard will be amended.

4.2.4 Reaction to fire

Reaction to fire classification of the product, as placed on the market, shall be determined in accordance with EN 13501-1, Annex F and the basic Mounting and Fixing rules given in EN 15715.

NOTE 1 This classification is compulsory and always included in the CE Marking label.

Detailed information about the test conditions and the field of application of the classification as stated in the reaction to fire classification report shall be given in the manufacturer's literature.

Manufacturers declaring Euroclass A1 without further test shall demonstrate by testing in accordance with EN 13820 that the products do not contain more than 1,0 % by weight of organic matter.

NOTE 2 The Commission Decision 96/603/EC of 4 October 1996 amended by the Commission Decision 00/605/EC of 26 September 2000 gives the list of products to be considered as reaction to fire class Euroclass A1 without the need for testing.

4.2.5 Durability characteristics

4.2.5.1 General

The appropriate durability characteristics have been considered and are covered in 4.2.5.2, 4.2.5.3 and 4.2.5.4.

4.2.5.2 Durability of reaction to fire against ageing/degradation

The fire performance of mineral wool does not deteriorate with time. The Euroclass classification of the product is related to the organic content, which cannot increase with time.

4.2.5.3 Durability of thermal conductivity against ageing/degradation

Thermal conductivity of mineral wool products does not change with time, experience has shown the fibre structure to be stable and the porosity contains atmospheric air.

4.2.5.4 Durability of thermal resistance against ageing/degradation

Durability of the thermal resistance is covered by the durability of the installed thickness influence by settlement treated in 4.2.3.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

4.3 For specific applications

4.3.1 General

If there is no requirement for a property described in 4.3, for a product in use, then the property need not be determined and declared by the manufacturer.

4.3.2 Airflow resistivity

Airflow resistivity shall be determined in accordance with EN 29053:1993, method A, and Annex E. The value of airflow resistivity shall be declared in levels with steps of 1 kPa·s/m^2. No test result shall be lower than the declared value.

NOTE Airflow resistivity can be used when estimating the risk for reduced thermal resistance caused by convection.

4.3.3 Water absorption

Short-term water absorption by partial immersion, W_p, shall be determined in accordance with EN 1609:1996, method A, with specimen preparation in accordance with Annex D. No test result of the water absorption W_p, shall exceed 1,0 kg/m^2.

4.3.4 Water vapour diffusion resistance

Water vapour transmission properties shall be declared as the water vapour diffusion resistance factor μ for homogeneous products.

The blown mineral wool has a structure that is highly permeable to water vapour. The water vapour resistance factor, μ, can be assumed to be 1.

Alternatively, values cited in EN 12524:2000, Table 2, may be used.

4.3.5 Reaction to fire of product in standardized assemblies simulating end-use applications

Reaction to fire classification of products in standardized assemblies simulating end-use applications, shall be determined in accordance with EN 13501-1, Annex G and the basic Mounting and Fixing rules given in EN 15715.

This classification offers the opportunity to give a complementary and optional declaration on reaction to fire for standard test configurations of assemblies which include the insulation product.

The number of the selected test configuration of assembly (Table 5 of EN 15715:2009) which is used in the test shall be quoted with the Euroclass.

Detailed information about the test conditions and the field of application of the classification as stated in the reaction to fire classification report shall be given in the manufacturer's literature.

4.3.6 Release of dangerous substances

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material or permitted in the national regulations of the member state of destination.

NOTE See Annex ZA.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

4.3.7 Continuous glowing combustion

Where subject to regulation, a manufacturer shall declare the continuous glowing combustion according to national test method where available.

NOTE A European test method is under development and the standard will be amended when this is available.

5 Test methods

5.1 Sampling

Test specimens shall be taken from the same sample with a total amount of not less than 0,5 m^3 and sufficient to cover the needed tests.

5.2 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.

5.3 Testing

5.3.1 General

Table 3 gives the dimensions of the test specimens, the minimum number of measurements required to get one test result and any specific conditions which are necessary.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table 3 — Test methods, test specimens and conditions

Dimensions in millimetres

Clause	Title	Test method	Test specimen		Specific conditions
			Dimensions	Number to get one test result	
4.2.1	Thermal resistance and thermal conductivity	EN 12667	≥(500 × 500 × 100)	1	Measuring area: ≥(250 × 250) See Annex C
4.2.3	Settlement	Annex K	600 × 600 × 300	1	See text in 4.2.3 [a]
4.2.4	Reaction to fire	See EN 13501-1 and EN 15715			See Annex F
4.3.2	Airflow resistivity	EN 29053	according the measurement apparatus	1 per 0.5 m²	Method A See Annex E
4.3.3	Water absorption	EN 1609	200 × 200 Height ≥50	4	Method A See Annex D
4.3.4	Water vapour transmission	[b]	-	-	
4.3.5	Reaction to fire	See EN 13501-1 and EN 15715			See Annex G
4.3.6	Release of dangerous substances	[c]	-	-	-
4.3.7	Continuous glowing combustion	[c]	-	-	-

[a] If no test result is available 10 % settlement shall be used for calculation of thermal resistance.

[b] The water vapour resistance factor, μ, can be assumed to be 1.

[c] Not yet available.

5.3.2 Thermal resistance and thermal conductivity

Thermal conductivity shall be determined in accordance with EN 12667 under the following conditions:

— at a mean temperature of (10 ± 0,3) °C;

— after conditioning in accordance with 5.2;

— the test specimen shall be prepared according to Annex C of this standard.

Thermal resistance and thermal conductivity may also be measured at mean temperatures other than 10 °C, if the correlation of the relationship between temperature and thermal properties is documented.

Thermal resistance and thermal conductivity shall be determined directly at the thickness is shown in the performance chart. Determination can be made on other thicknesses of the product providing that:

— the product is of similar chemical and physical characteristics and is produced on the same production unit;

— it can be demonstrated in accordance with EN 12667 that the thermal conductivity does not vary more than 2 % over the range of thicknesses where the calculation is applied.

5.3.3 Reaction to fire

Test shall be carried out in accordance with EN 13501-1.

Rules for mounting and fixing when testing are given in EN 15715, Annex F and Annex G.

6 Designation code

The manufacturer shall give a designation code for the product. The following shall be included except when there is no requirement for a property described in 4.3:

— In-situ formed loose-fill mineral wool abbreviated term MW

— This EN standard number EN 14064-1

— Settlement class Si

— Airflow resistivity AFi

— Water absorption WS

— Water vapour diffusion resistance factor MUi

— Thermal conductivity

where "i" shall be used to indicate the relevant class or level.

The designation code for a loose-fill mineral wool product is illustrated by the following example:

MW EN 14064-1 – S1 – AF38 – WS – MU1

7 Evaluation of conformity

7.1 General

The manufacturer or his authorised representative established shall be responsible for the conformity of his product with the requirements of this European Standard. The evaluation of conformity shall be carried out in accordance with EN 13172 and shall be based on initial type testing (ITT), factory production control (FPC) by the manufacturer, including product assessment and tests on samples taken at the factory.

The compliance of the product with the requirements of this standard and with the stated values (including classes) shall be demonstrated by:

— Initial type testing (ITT);

— Factory production control by the manufacturer, including product assessment.

If a manufacturer decides to group his products, it shall be done in accordance with EN 13172.

The manufacturer or his authorised representative shall make available, in response to a request, a certificate or declaration of conformity as appropriate.

NOTE For the EC certificate and declaration of conformity, as appropriate, see ZA.2.2.

7.2 Initial type testing

ITT shall be carried out in accordance with EN 13172 for all characteristics declared.

7.3 Factory production control

FPC testing shall be made for the characteristics listed in Annex B, when declared.

The minimum frequencies of tests in the factory production control shall be in accordance with Annex B of this document. When indirect testing is used, the correlation to direct testing shall be established in accordance with EN 13172.

8 Marking and labelling

Products conforming to this standard shall be clearly marked, either on the label on the packaging or on the delivery note, with the following information:

— product name or other identifying characteristic;

— name or identifying mark and address of the manufacturer or his authorised representative established;

— shift or time or traceability code;

— reaction to fire class of the product as placed on the market. This classification shall be identified with the designation "product" after the classification;

NOTE 1 If reaction to fire tests on standardised assemblies have been performed according to Clause 6 of EN 15715:2009, then the reaction to fire classification should be added and identified with the designation "standardised assembly no. x" after the classification. This information should be kept distinct from the CE marking.

The number of the standardised assembly is taken from Table 5 of EN 15715:2009. Reference should be made to manufacturer's literature (ML) for further information about fire performance.

For CE marking and labelling, see ZA.3.

— designation code as given in Clause 6;

— quantity of material in the package;

— performance chart in the format of Tables 4, 5 or 6, whichever is applicable.

NOTE 2 Tables 4, 5 and 6 are given without any values. Annex H gives guidelines and examples of charts with values in all columns. The declared thermal resistance level is for the insulation only, disregarding the effects of studs, beams, rafters, etc.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table 4 — Performance chart for loft applications

Loft insulation				
Declared thermal resistance level R (m^2·K/W)	**Thickness after settlement** mm	**Minimum installed thickness** mm	**Minimum coverage** kg/m^2	**Minimum bag usage rate** bags per 100 m^2

The values for minimum installed thickness refer to the thickness immediately following installation. The values for declared thermal resistance level refer to the situation after settlement has occurred.

Table 5 — Performance chart for masonry cavity wall applications

Masonry cavity wall insulation		
Cavity width mm	**Declared thermal resistance level** R (m^2·K/W)	**Minimum bag usage rate** bags per 100 m^2

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table 6 — Performance chart for frame applications

Frame insulation		
Frame width mm	**Declared thermal resistance level** R (m^2·K/W)	**Minimum bag usage rate** bags per 100 m^2

Annex A
(normative)

Determination of the declared values of thermal resistance and thermal conductivity

A.1 Introduction

It is the responsibility of the manufacturer to determine the declared value of thermal resistance and thermal conductivity. He will have to demonstrate conformity of the product to its declared value. The declared value of thermal resistance and thermal conductivity of a product are the expected value of the property during an economically reasonable working life under normal conditions, assessed through measured data at reference conditions.

According to 4.2 and Clause 8 the declaration is given in the form of one or more performance charts worked out according to Annex I, which requires the manufacturer to determine the conductivity as a function of density.

A.2 Input data

The manufacturer shall have at least ten test results for thermal resistance and thermal conductivity, obtained from external direct or from internal direct measurements in order to calculate the declared values. The direct thermal resistance and thermal conductivity measurements shall be carried out at regular intervals spread over a period of the last twelve months. If less than ten direct test results are available, that period may be extended until ten test results are reached, but with a maximum period of three years, within which the product and production conditions have not changed significantly.

For new products the ten thermal resistance or thermal conductivity test results shall be carried out spread over a minimum period of ten days.

The declared thermal values and their corresponding densities shall be calculated according to one of the methods given in A.3 at intervals not exceeding three months of production.

If the method described in A.3.2, Equation (A.3), is chosen, the manufacturer establishes a curve for thermal conductivity versus density for the chosen product and calculate the density $\rho_{90/90}$.

The declared thermal conductivity λ_D will correspond to the value of the thermal conductivity read on the curve for a density equal to $\rho_{90/90}$. Moreover, the manufacturer has to calculate, from production data, a $\rho_{90/90}$ as described in J.2.

A.3 Declared values

A.3.1 General

The derivation of the declared values R_D and λ_D from the calculated values, $R_{90/90}$ and $\lambda_{90/90}$, shall use the rules given in 4.2.1, which include the rounding conditions.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

A.3.2 Case where thermal resistance and thermal conductivity are declared

The declared value, R_D and λ_D, shall be derived from the calculated value, $R_{90/90}$ and $\lambda_{90/90}$, which are determined using Equations (A.1) or (A.2), (A.3) and (A.4).

$$\lambda_{90/90} = \lambda_{mean} + k \cdot s_\lambda \quad \text{(A.1)}$$

$$s_\lambda = \sqrt{\frac{\sum_{i=1}^{n} (\lambda_i - \lambda_{mean})^2}{n-1}} \quad \text{(A.2)}$$

or

$$\lambda_{90/90} = \lambda(\rho_{90/90}) \quad \text{(A.3)}$$

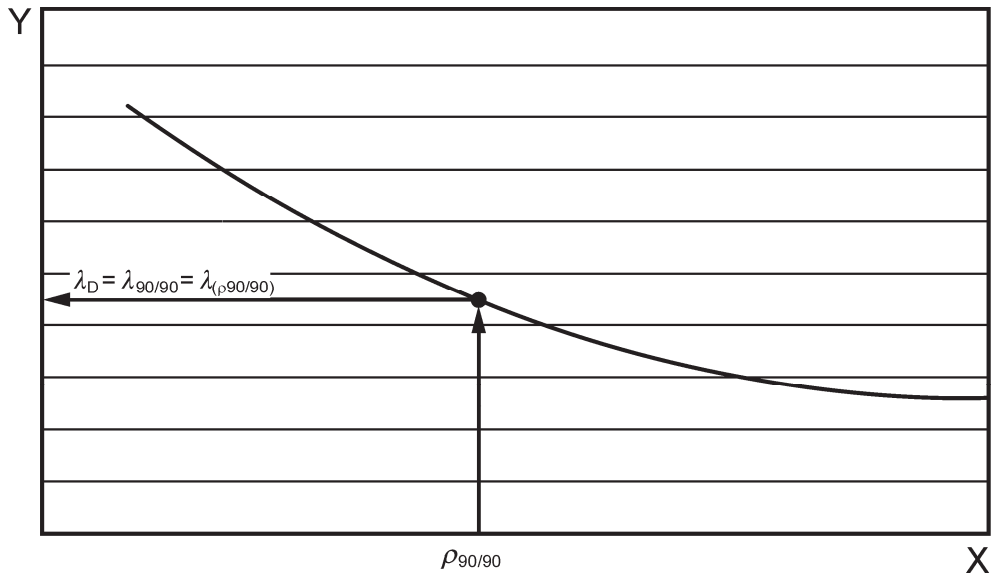
where

$\lambda(\rho_{90/90})$ is the lambda read on the curve $\lambda(\rho)$ defined in 4.2.1, for a density equal to $\rho_{90/90}$;

$\rho_{90/90}$ is determined as described in J.2.

$R_{90/90} = d/\lambda_{90/90}$. (A.4)

The following graphic (Figure A.1) is an illustration of the $\lambda_{90/90}$ determination.



Key

X Density in kilograms per cubic metre (kg/m^3)

Y Thermal conductivity in milliwatts per metre · Kelvin (mW/(m · K))

Figure A.1 — Determination of $\lambda_{90/90}$ using the curve $\lambda(\rho)$

A.3.3 Case where only thermal resistance is declared

The declared value, R_D, shall be derived from the calculated value, $R_{90/90}$ which is determined using Equations (A.5) and (A.6)

$$R_{90/90} = R_{mean} - k \cdot s_R \quad \text{(A.5)}$$

$$s_R = \sqrt{\frac{\sum_{i=1}^{n} (R_i - R_{mean})^2}{n-1}} \quad \text{(A.6)}$$

Table A.1 — Values for k for one sided 90 % tolerance interval with a confidence level of 90 %

Number of test results	k
10	2,07
11	2,01
12	1,97
13	1,93
14	1,90
15	1,87
16	1,84
17	1,82
18	1,80
19	1,78
20	1,77
22	1,74
24	1,71
25	1,70
30	1,66
35	1,62
40	1,60
45	1,58
50	1,56
100	1,47
300	1,39
500	1,36
2 000	1,32
NOTE For other numbers of test results use ISO 12491 or linear interpolation.	

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Annex B
(normative)

Factory production control

Table B.1 — Minimum product testing frequencies [a]

Clause	Title	Direct testing	Indirect testing	
			Test method	Frequency
4.2.1	Thermal resistance and thermal conductivity	1 per day or	—	—
		1 every three months for each product/product group and indirect testing	Manufacturer's method, e.g. blown density	1 per day
4.2.2	Weight of the sale unit	Each unit	—	—
Annex K	Coverage and density	1 per day or	—	—
		1 every three months for each product/product group and indirect testing	Manufacturer's method, e.g. blown density	1 per day
4.2.3	Settlement	initial type test	—	—
4.2.4	Reaction to fire	See Table B.2		
4.3.2	Air flow resistivity	1 per year	—	—
4.3.3	Water absorption	1 per month and indirect	manufacturer's method	1 per day
4.3.4	Water vapour diffusion resistance	1 per year	—	—
4.3.6	Release of dangerous substances	[b]	—	—
4.3.7	Continuous glowing combustion	[b]	—	—

[a] The minimum testing frequencies shall be understood as the minimum for each production unit/line under stable manufacturing conditions. If for example the production per day is only 8 h, every day is a new start. In addition to the testing frequencies given above, testing of the relevant properties of the product shall be repeated when changes or modifications are made that are likely to affect the conformity of the product.

[b] Frequencies are not given, as test methods are not yet available.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table B.2 — Minimum product testing frequencies for the reaction to fire characteristics

Clause		Minimum testing frequency [a]			
No	**Title**	**Direct testing** [b]		**Indirect testing** [c d]	
4.2.4	Reaction to fire class			**Product**	
		Test method	**Frequency**	**Test method**	**Frequency**
	A1 without testing [e]	EN 13820	1 per three months or 1 per two years and indirect testing	—	—
				Loss on ignition	1 per 4 h
	A1	EN ISO 1182 and EN ISO 1716 (and EN 13823)	1 per two years and indirect testing	Loss on ignition	1 per 4 h
				Apparent density of the primary mat	1 per 1 h
	A2	EN ISO 1182 or EN ISO 1716 and EN 13823	1 per two years and indirect testing	Loss on ignition	1 per 4 h
				Apparent density of the primary mat	1 per 1 h
	B C D	EN 13823 and EN ISO 11925-2	1 per month or 1 per two years and indirect testing	—	—
				Manufacturer's method	1 per day
			1 per week or 1 per two years and indirect testing	—	—
				Manufacturer's method	1 per day
	E	EN ISO 11925-2	1 per week or 1 per two years and indirect testing	–	–
				Manufacturer's method	1 per day
	F	—	—	—	—

NOTE Not all Euroclasses may apply for the products conforming to this standard.

a The minimum testing frequencies, expressed in test results, shall be understood as the minimum for a product or a product group for each production unit/line under stable conditions. In addition to the testing frequencies given above, testing of relevant properties of the product shall be repeated when changes or modifications are made that are likely to affect the conformity of the product.

b Direct testing may be conducted either by third party or by the manufacturer.

c Indirect testing shall be either on the product or on its components.

d Indirect testing is only possible in the case of products falling within the System 1 for attestation of conformity of reaction to fire or by having a Notified Body verifying the direct testing.

e Commission Decision 96/603/EC: Materials to be considered as reaction to fire class A provided for in Decision 94/611/EC without the need for testing (of reaction to fire characteristics).

Annex C
(normative)

Specimen preparation method for thermal resistance and thermal conductivity test

C.1 Principle

The insulation product shall be blown into a square rigid frame large enough to provide a test specimen corresponding to the dimensions listed in Table 3.

C.2 Procedure

C.2.1 Specimen preparation method for ventilated roof spaces application.

The frame shall be made of rigid insulating material, e.g. cellular plastic. The bottom of the frame shall be made of thin material that will only give a negligible contribution to the total thermal resistance, e.g. plastic foil. In order to get a flat bottom of the frame a rigid sheet shall be placed under the plastic foil to support it during blowing and transportation.

Weigh the empty frame and the supporting sheet before the blowing is carried out. Record the weight.

Measure the height of the frame; this will be the test specimen thickness.

The blowing shall be carried out with a commercial type blowing machine according to the manufacturer's instructions, including hose type, length and diameter and machine setting (blowing air flow, blowing material flow). The machine shall be loaded with sufficient material at least one bag of insulation material to give an even flow during the whole specimen preparation process. The specimen frame shall be placed some metres in front of the end of the blowing nozzle. The distance depends on the machine type and setting. When the machine is started, the nozzle shall be pointed away from the specimen frame.

When the insulation is flowing smoothly, the specimen frame shall be filled using a slow, smooth sweeping action from side to side, overlapping both sides of the specimen frame by approximately 0,5 m. The end of the blowing hose shall be held 0,8 m to 1,1 m off the ground with the end portion of the hose horizontal at all times. The distance of the operator from the frame shall be such that the insulation is falling into the frame. The hose shall not be pointed downward or upward when preparing the specimen. When the specimen frame is approximately half full, the nozzle shall be pointed away from it and the machine shall be stopped. Rotate the frame 180° so that the back of the frame is now facing the operator. Do not shake the frame in order to avoid settling of the insulation. Restart the machine and fill the rest of the frame in the same manner as before.

To avoid air gaps between the specimen and the plates of the guarded hot plate or heat flow meter apparatus, the frame shall be overfilled. After blowing, remove excess material leaving maximum 20 % over thickness to avoid air gap. The insulation surface shall be flat and the specimen shall have an even insulation distribution. Gently carry the specimen to the thermal conductivity apparatus. Place the specimen in the apparatus by sliding the frame and bottom foil from the supporting sheet to the bottom plate of the thermal conductivity apparatus. After the thermal conductivity measurement, the filled frame and the supporting sheet shall once again be weighed.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

C.2.2 Specimen preparation method for closed cavities application.

The density of the test specimen shall be equal to the minimum density providing no settlement in the closed cavities. The following procedure shall be applied.

The frame shall be made of rigid insulating material, e.g. cellular plastic. The bottom of the frame shall be made of thin material that will only give a negligible contribution to the total thermal resistance, e.g. plastic foil. In order to get a flat bottom of the frame a rigid sheet shall be placed under the plastic foil to support it during blowing and transportation.

Weigh the empty frame and the supporting sheet before the blowing is carried out. Record the weight w_1.

Measure the height of the frame; this will be the test specimen thickness, record the height h_1.

With the height h_1 and the area of the frame, calculate the weight w_2 of insulation product needed in the frame to have the required minimum density.

The blowing method described in C.2.1 shall be applied.

After blowing, remove excess material until the desired weight w_2 in the frame is reached.

If it is needed, the insulation product can be slowly compressed, with a plate of same area as the frame used, to reach the height h_1.

Leave maximum 10 % over thickness to avoid air gap between the specimen and the plates of the guarded hot plate or heat flow meter apparatus.

The insulation surface shall be flat and the specimen shall have an even insulation distribution. Gently carry the specimen to the thermal conductivity apparatus. Place the specimen in the apparatus by sliding the frame and bottom foil from the supporting sheet to the bottom plate of the thermal conductivity apparatus.

Annex D
(normative)

Specimen preparation method for water absorption test

D.1 Principle

The insulation is blown into a test cage. The blown insulation is then used to create a test specimen with coverage and density in accordance with the manufacturers performance chart.

D.2 Procedure

The insulation product shall be blown into a test cage made from stainless steel mesh with an open area of at least 50 %. The cage shall have inside dimensions of (200 ± 1) mm $\times$ (200 ± 1) mm $\times$ 50 mm with a removable face for installing the insulation product.

Weigh the empty test cage before the blowing is carried out. Record the weight, w_1.

Calculate the weight of the insulation, w_2, needed to get a specimen corresponding to the density at the minimum bag usage rate of the performance chart.

The blowing shall be carried out with a commercial type blowing machine. The machine shall be loaded with sufficient material at least one bag of insulation material to give an even flow during the whole specimen preparation process. The specimen frame shall be placed some metres in front of the end of the blowing nozzle. The distance depends on the machine type and setting. When the machine is started the nozzle shall be pointed away from the specimen frame.

When the insulation is flowing smoothly, the test cage shall be filled using a slow, smooth sweeping action from side to side, overlapping both sides of the test cage by approximately 0,5 m. The end of the blowing hose shall be held 0,8 m to 1,1 m off the ground with the end portion of the hose horizontal at all times. The distance of the operator from the test cage shall be such that the insulation is falling into the cage. The hose shall not be pointed downward or upward when preparing the specimen. When the specimen frame is approximately half full, the nozzle shall be pointed away from it and the machine shall be stopped. Rotate the frame 180° so that the back of the test cage is now facing the operator. Do not shake the frame unnecessarily in order to avoid settling of the insulation. Restart the machine and fill the rest of the test cage in the same manner as before.

After blowing, the filled test cage shall once again be weighed. In order to get a specimen in accordance with the performance chart, insulation shall be removed until the desired total weight, $w_1 + w_2$, is reached.

Replace the movable lid, compressing the insulation to the internal dimensions of the cage.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Annex E
(normative)

Specimen preparation method for airflow resistivity test

E.1 Principle

The insulation is first blown into a box. The blown insulation is then used to create a test specimen with coverage and density in accordance with the manufacturers performance chart.

E.2 Procedure

The insulation product shall be blown into a box with dimensions according to the device measurement.

In case of rigid frame use, measure the height of the frame; this will be the test specimen thickness.

Weigh the empty box before blowing. Record the weight, w_1.

Calculate the weight of the insulation, w_2, needed to get a specimen corresponding to the density at the minimum bag usage rate of the performance chart.

The blowing shall be carried out with a commercial type blowing machine. The machine shall be loaded with sufficient material at least one bag of insulation material to give an even flow during the whole specimen preparation process. The specimen box shall be placed some metres in front of the end of the blowing nozzle. The distance depends on the machine type and setting. When the machine is started the nozzle shall be pointed away from the specimen box.

When the insulation is flowing smoothly, the specimen box shall be filled using a slow, smooth sweeping action from side to side, overlapping both sides of the specimen box by approximately 0,5 m. The end of the blowing hose shall be held 0,8 m to 1,1 m off the ground with the end portion of the hose horizontal at all times. The distance of the operator from the box shall be such that the insulation is falling into the box. The hose shall not be pointed downward or upward when preparing the specimen. When the specimen box is approximately half full, the nozzle shall be pointed away from it and the machine shall be stopped. Rotate the box 180° so that the back of the box is now facing the operator. Do not shake the box unnecessarily in order to avoid settling of the insulation. Restart the machine and fill the rest of the box in the same manner as before.

After blowing, the specimen shall have an even distribution and a density in accordance with the manufacturer's performance chart.

The insulation surface shall be flat and the specimen shall have an even insulation distribution. The frame shall be overfilled, but not by more than 20 % of the frame. The filled box is taken to the test apparatus. The insulation is gently moved to the measurement cell.

NOTE The testing device can be directly filled by blowing.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Annex F
(normative)

Testing for reaction to fire of products

F.1 Scope

This annex gives the basic rules for reaction to fire testing on mineral wool products as placed on the market (product itself), including instructions for mounting and fixing (M&F).

NOTE This annex is necessary for CE marking and deals with the insulation product in the same condition as placed on the market.

F.2 Product and installation parameters

Tables F.1 and F.2 give the parameters that have to be taken into account when determining a product's reaction to fire performance and the field of application of the test results.

Table F.1 — Product parameters

Product Parameters	EN ISO 1182 (class A1 and A2)	EN ISO 1716 (class A1 and A2)	EN 13823 (SBI) (class A1 to D)	EN ISO 11925-2 (Ignitability) (class B to E)
Mineral wool products				
Thickness	No influence	No influence	X	No influence
Density	No influence	No influence	X	X
Type of product	Test on the highest amount of organic content (expressed in kilograms per cubic metre (kg/m^3)) is valid for lower organic content of the same type of binder		Test on the highest amount of organic content (expressed in kilograms per cubic metre (kg/m^3)) is valid for lower organic content of the same type of binder	

Table F.2 — Installation parameters

Installation Parameter	EN 13823 (SBI) (class A1 to D)	EN ISO 11925-2 (Ignitability) (class B to E)
Substrate	X	Not revelant
Air gaps/Cavities	—	Not revelant
Joints/edges	—	Not revelant
Size and positioning of test specimen	X	Not revelant
Fixing of test specimen	X	Not revelant
Product orientation and geometry	—	—
Exposure to thermal attack	X	X

Ageing or washing procedures are not applicable to MW products.

F.3 Standardized Mounting and fixing

F.3.1 Test specimens for EN ISO 11925-2 (Ignitability) and EN 13823 (SBI)

As MW loose fill products with binder are manufactured by granulating preformed factory made products, the test specimen is taken from a factory made product made in the same plant and having equal or more organic content.

The test specimens shall be stored for at least 6 h at (23 ± 5) °C. In case of dispute they shall be stored at (23 ± 2) °C and (50 ± 5) % relative humidity (RH) for 14 days.

F.3.2 EN ISO 11925-2 (Ignitability)

Mounting and fixing is defined in EN 15715.

Measured thickness: 60 mm.

F.3.3 EN 13823 (SBI)

Mounting and fixing is defined in EN 15715.

Measured thickness: 100 mm.

Annex G
(normative)

Testing for reaction to fire of products in standardised assemblies simulating end-use application(s)

G.1 Scope

This annex gives the basic rules for an additional reaction to fire testing on mineral wool products in standardized assemblies simulating end-use application including instructions for mounting and fixing (M&F) and the field of application of the test results.

Further in this annex the phrase "standard test configuration of assemblies" is used.

This annex gives the manufacturer the opportunity to give a complementary and optional declaration on reaction to fire for a standardised end use application/assembly including the insulation product.

The Euroclass of the product as placed on the market shall always be declared.

G.2 Product and installation parameters

Tables G.1 and G.2 give the parameters that have to be taken into account when determining the reaction to fire performance of standardized assemblies end use applications and the field of application of the test results.

Table G.1 — Product parameters

Product Parameters	EN ISO 1182 (class A1 and A2)	EN ISO 1716 (class A1 and A2)	EN 13823 (SBI) (class A1 to D)	EN ISO 11925-2 (Ignitability) (class B to E)
Mineral wool products				
Thickness	No influence	No influence	X	No influence
Density	No influence	No influence	X	X
Type of product	Test on the highest amount of organic content (expressed in kilograms per cubic metre (kg/m^3)) is valid for lower organic content of the same type of binder		Test on the highest amount of organic content (expressed in kilograms per cubic metre (kg/m^3)) is valid for lower organic content of the same type of binder	

Table G.2 — Installation parameters

Installation Parameter	EN 13823 (SBI) (class A1 to D)	EN ISO 11925-2 (Ignitability) (class B to E)
Substrate	X	Not revelant
Air gaps/Cavities	—	Not revelant
Joints/edges	—	Not revelant
Size and positioning of test specimen	X	Not revelant
Fixing of test specimen	X	Not revelant
Product orientation and geometry	—	—
Exposure to thermal attack	X	X

Ageing or washing procedures are not applicable to MW products.

G.3 Standardized Mounting and fixing

G.3.1 Test specimens for EN ISO 11925-2 (Ignitability) and EN 13823 (SBI)

The test specimen is taken from a factory made product made in the same plant as the blowing wool (EN 13162) and having equal or more organic content.

The test specimens shall be stored for at least 6 h at (23 ± 5) °C. In case of dispute they shall be stored at (23 ± 2) °C and (50 ± 5) % relative humidity (RH) for 14 days.

G.3.2 EN ISO 11925-2 (Ignitability)

Mounting and fixing is defined in EN 15715.

Measured thickness: 60 mm.

G.3.3 EN 13823 (SBI)

Mounting and fixing is defined in EN 15715.

Measured thickness: 100 mm.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Annex H
(normative)

Rules for creating performance charts for loose-fill insulation and examples of performance charts

H.1 General

A performance chart is a table giving the installed insulation thickness, and the number of bags of insulation to be used to obtain the declared thermal resistance.

The manufacturer of the loose-fill insulation product calculates the values of the chart in accordance with the procedure below.

NOTE The chart only should only be recalculated in case of product declared value changes.

H.2 Performance chart for loft insulation

Decide the density, ρ in kilograms per cubic metre (kg/m^3) of the installed product after settlement.

Determine the declared thermal conductivity, λ_D (W/m·K) for the product at that density using the curve $\lambda(\rho)$ define in 4.2.1.

Determine the thickness reduction by settlement, s of the product at the chosen density. In cavity walls and frame constructions there is no thickness reduction by settlement which makes s = 0 in these cases.

Loose-fill thermal insulation can be used to create insulation layers with a variety of thicknesses and thermal resistances. Choosing a range for the declared thermal resistance R_D (m^2·K/W) typical for the applications of the product in question.

For each value of R_D calculate the corresponding insulation thickness after settlement, d (m) using the formula:

$$d = R_D \cdot \lambda_D \quad \text{(H.1)}$$

For loft insulation calculate the thickness before settlement corresponding to each thickness after settlement using the formula:

$$d_{before} = d/(1 - s) \quad \text{(H.2)}$$

EXAMPLE If d = 0,200 m (200 mm) and s = 5 %, then d_{before} = 0,200/(1 – 0,05) = 0,211 m (211 mm).

For each value of R_D calculating the coverage (kg/m^2) using the formula:

$$\text{coverage} = d \cdot \rho \quad \text{(H.3)}$$

Decide what bag weight, B_{nom} (kg) to use for the insulation product.

For each value of R_D calculate the number of bags needed to insulate 100 m^2 using the formula:

$$\text{number of bags} = 100 \cdot d \cdot \rho / B_{nom} \quad \text{(H.4)}$$

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

All calculations are made with three significant figures and declared in levels as follows:

R declared in steps of 0,5 m^2K/W;

Minimum installed thickness rounded to nearest higher 5 mm and declared in steps of 5 mm;

Minimum coverage rounded to nearest higher 0,1 kg/m^2 and declared in steps of 0,1 kg/m^2;

Minimum bag usage rate rounded to nearest 0,1 bag and declared in steps of 0,1 bag.

Place the calculated values in a performance chart – see examples below.

Table H.1 — Performance chart for loft applications

Declared thermal resistance level $m^2 \cdot K/W$	Thickness after settlement mm	Minimum installed thickness mm	Minimum coverage kg/m^2	Minimum bag usage rate bags per 100 m^2
R2,0	84	90	2,4	16,1
R3,0	126	135	3,6	24,1
R4,0	168	180	4,8	32,1
R5,0	210	225	6,0	40,2
R6,00	252	270	7,2	48,2
R7,00	294	310	8,2	55,3
R8,00	336	355	9,4	63,4
R9,00	378	400	10,6	71,4
R10,00	420	445	11,8	79,4

H.3 Performance chart for masonry cavity wall insulation and frame constructions insulation

Decide the density, ρ in kilograms per cubic metre (kg/m^3) of the installed product giving zero settlement.

Determine the declared thermal conductivity, λ_D (W/m·K) for the product at that density.

Choose a range of widths typical for the applications of the product in question.

For each value of width calculate the corresponding R_D using the formula:

$$R_D = d/\lambda_D \quad \text{(H.5)}$$

For each value of *d* calculate the coverage (kg/m^2) using the formula:

$$\text{coverage} = d \cdot \rho \quad \text{(H.6)}$$

Decide what bag weight, B_{nom} (kg) to use for the insulation product.

For each value of *d* calculating the number of bags needed to insulate 100 m^2 using the formula:

$$\text{number of bags} = 100 \cdot d \cdot \rho / B_{nom} \quad \text{(H.7)}$$

All calculations are made with three significant figures and declared in levels as follows:

R rounded to nearest 0,1 m^2K/W and declared in steps of 0,1 m^2K/W;

Minimum bag usage rate rounded to nearest 0,1 bag and declared in steps of 0,1 bag.

Placing the calculated values in a performance chart – see examples below.

Table H.2 — Performance chart for Masonry cavity wall insulation

Cavity width mm	**Declared thermal resistance level** $m^2 \cdot K/W$	**Minimum bag usage rate** bags per 100 m^2
50	R1,3	15,0
55	R1,4	16,5
60	R1,5	18,0
65	R1,6	19,5
70	R1,8	21,0
75	R1,9	22,5
80	R2,0	24,0
85	R2,1	25,5
90	R2,3	27,0
95	R2,4	28,5
100	R2,5	30,5

Table H.3 — Performance chart for frame insulation

Frame width mm	**Declared thermal resistance level** $m^2 \cdot K/W$	**Minimum bag usage rate** bags per 100 m^2
50	R1,3	15,0
100	R2,5	30,0
150	R3,8	45,0
200	R5,0	60,0
250	R6,3	75,0
300	R7,5	90,0
350	R8,8	105,0
400	R10,0	120,0

Annex I
(normative)

Verification of performance chart according to Annex H (normative)

I.1 Principle

As the performance chart is based upon the declared thermal conductivity λ_D and the corresponding declared density ρ_D, the verification shall control these parameters according to the requirements in 4.2.1.

I.2 Procedure

The manufacturer establishes a curve for thermal conductivity versus density for the chosen product. The manufacturer has to calculate, from production data, a $\rho_{90/90}$ as follows:

$$\rho_{90/90} = \rho_{mean} - k \cdot S_\rho \quad \text{(I.1)}$$

$$\text{with } s_\rho = \sqrt{\frac{\sum_{i=1}^{n} (\rho_i - \rho_{mean})^2}{n-1}} \quad \text{(I.2)}$$

This density $\rho_{90/90}$ is the declared density (ρ_D) of the product used for the performance chart.

For each production the manufacturer shall verify that the calculated $\rho_{90/90}$ from production data is more or equal than the declared density ρ_D.

The density ρ_i is determined as described in Annex K

The thermal conductivity when testing according to 4.2.1 shall not exceed the curve for thermal conductivity versus density by more than 6 % for one test result.

The measurements according to 4.2.1 shall be distributed between the lower density and higher density of the density/conductivity curve.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Annex J
(normative)

Specimen preparation method for coverage and density measurement

J.1 Principle

To determine the coverage value of the product for a ventilated roof space application, the insulation product shall be blown into a 2 m × 1 m × 0,2 m box, other thickness (minimum 100 mm) can be chosen depending on the intended used. The thickness and the weight of the box, before and after filling, shall be recorded to calculate the density.

To determine the density value for a closed construction application, the insulation product shall be blown in a closed space, the dimension of this cavity are measured (height, width, depth of the cavity) the insulation is collected and weight to calculate the density.

J.2 Procedure for ventilated roof space application

Weigh the empty box before the blowing is carried out. Record the weight w_1 in kilograms (kg).

The blowing shall be carried out with a commercial type blowing machine according to the manufacturer instructions, including hose type, length and diameter machine setting (blowing air flow, blowing material flow). The machine shall be loaded with sufficient material at least one bag of insulation material to give an even flow during the whole specimen preparation process. The specimen frame shall be placed some metres in front of the end of the blowing nozzle. The distance depends on the machine type and setting. When the machine is started, the nozzle shall be pointed away from the specimen frame.

The blowing shall be done in the direction of the longer side of the frame.

When the insulation is flowing smoothly, the specimen frame shall be filled using a slow, smooth sweeping action from side to side, overlapping both sides of the specimen frame by approximately 0,5 m. The end of the blowing hose shall be held 0,8 m to 1,1 m off the ground with the end portion of the hose horizontal at all times. The distance of the operator from the frame shall be such that the insulation is falling into the box. The hose shall not be pointed downward or upward when preparing the specimen. When the specimen frame is approximately half-full, the nozzle shall be pointed away from it and the machine shall be stopped. Rotate the frame 180° so that the back of the frame is now facing the operator. Do not shake the frame in order to avoid settling of the insulation. Restart the machine and fill the rest of the frame in the same manner as before.

After blowing, the over thickness of insulation shall be eliminated and the insulation surface shall be flat and the specimen shall have an even insulation distribution. The height of the insulation shall be equal to the frame height.

The thickness measurements shall be made to the nearest 1 mm at eight positions evenly distributed over the area of the box, in accordance with EN 823 but under a (20 ± 1,5) Pa plate of 200 mm × 200 mm dimension.

The insulation thickness, d, is the average value of the eight measurements.

Record the weight of the filled box w_2 in kilograms (kg).

The density in kilograms per cubic metre (kg/m^3) is:

$$\rho_i = \frac{w_2 - w1}{A \times d} \quad \text{(J.1)}$$

A is the area of the box in square metres (m²).

J.3 Procedure for closed construction

Measure the dimension of the closed cavity and calculate its volume.

Fill the closed construction by blowing the insulation product into the cavity.

The blowing shall be carried out with a commercial type blowing machine according to the manufacturer instructions, including hose type, length and diameter, drilling pattern and machine setting.

When the cavity is filled, collect the totality of the insulation blown into the cavity, and record the weight of insulation w_1.

The density in kilograms per cubic metre (kg/m^3) is:

$$\rho_i = \frac{w_1}{V} \quad \text{(J.2)}$$

where

V is the volume of the closed cavity.

Annex K
(normative)

Thermal insulating products for lofts - Determination of settlement for blown loose fill insulation

K.1 Principle

A test specimen is made by blowing the product into a box. The box with the blown specimen is subjected to temperature and moisture cycling. At the beginning and during the climate cycling the change in thickness is monitored.

K.2 Apparatus

Open top box with inside dimensions (length, width, height) 600 mm ± 10 mm, 600 mm ± 10 mm, 300 mm + 20 mm - 0 mm, other thickness can be chosen depending the intended use. The thickness measurements shall be made to the nearest 1 mm at nine positions evenly distributed over the area of the box.

NOTE As an example nine rulers 320 mm long with maximum diameter 8 mm and graduated in millimetres (mm) are fixed at the base and are parallel with the sides of the box and evenly spaced across the base.

Climatic chamber large enough to accommodate the specimen box and providing a controlled climate in the range from 5 °C to 60 °C and relative humidity from 50 % relative humidity to 85 % relative humidity.

K.3 Test specimens

a) Preparation of test specimens

The specimen box is blown with insulation to a thickness of 300 mm according to the manufactures recommendations for installation.

b) Number of test specimens

The number of test specimen shall be at least two.

c) Conditioning of test specimens

The test specimens shall be stored for at least 6 h at (23 ± 2) °C. In case of dispute it shall be carried out at (23 ± 2) °C and (50 ± 5) % relative humidity.

K.4 Test procedure

To avoid settlement by shock during the installation, the test box with insulation is carefully installed in the climate chamber.

The test is composed of four cycles of two periods.

The chamber is controlled to the following conditions:

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Cycle 1: Period 1: 14 days at (23 ± 1) °C with (85 ± 5) % relative humidity

Period 2: 14 days at (50 ± 2) °C with (15 ± 5) % relative humidity

Cycle 2: Period 3: 14 days at (23 ± 1) °C with (85 ± 5) % relative humidity

Period 4: 14 days at (50 ± 2) °C with (15 ± 5) % relative humidity

Cycle 3: Period 5: 14 days at (23 ± 1) °C with (85 ± 5) % relative humidity

Period 6: 14 days at (50 ± 2) °C with (15 ± 5) % relative humidity

Cycle 4: Period 7: 14 days at (23 ± 1) °C with (85 ± 5) % relative humidity

Period 8: 14 days at (50 ± 2) °C with (15 ± 5) % relative humidity

The settlement of the insulation is recorded from each of the nine positions regularly and at least three times per week. The readings shall be taken to the nearest one millimetre.

K.5 Calculations and expression of results

For each specimen the mean value of the readings from the nine positions is one test result. This shall be used to create a graph of settlement over the time, based upon a best fit equation.

K.6 Test report

The test report shall include the following information:

a) reference to this EN;

b) product identification:

   1) product name;

   2) factory, manufacturer or supplier;

   3) production code number;

   4) type of product;

   5) packaging;

   6) the form in which the product arrived at the laboratory;

   7) other information as appropriate, e.g. nominal density;

c) test procedure:

   1) pre-test history and sampling, e.g. who sampled and where;

2) conditioning;

3) if any deviation from Clauses 6 and 7;

4) start and end date of testing;

5) general information relating to the test;

6) events which may have affected the results;

NOTE Information about the apparatus and identity of the technician should be available in the laboratory but it need not be recorded in the report.

d) results: mean value and graph of settlement as a function of time.

Annex L
(informative)

Masonry cavity walls - Method for determining suitable spacings for blowing holes

L.1 Test house

The test house (Figure L.1) has an outer brick leaf with stabilising piers and a transparent plastic inner leaf. The cavity width is nominally 75 mm and wall ties are spaced at standard centres for a masonry cavity wall. Features common to all masonry cavity walls are incorporated, doors and windows, air bricks, lintels and joist ends. The cavity is sealed at ceiling level.

L.2 Test method

The test house is filled from the outside using the specified insulant, pattern, equipment and technique.

L.3 Observations

The flow of insulant in the cavity is observed from the inside of the test house while filling takes place. There should be no significant unfilled areas under lintels and windows, at ceiling level, around air bricks and at the mid point between blowing holes both horizontally and vertically.

L.4 Installation procedure

The brickwork should be drilled using a pattern applicable to the insulation material.

The pattern sequence and size of drilled hole should be recorded on Figure L.1.

Installation details recording the total system used should be recorded in Table L.1.

Installation procedure indicating the blowing times for each hole should be recorded in Table L.2.

NOTE Due to the difference in friction characteristics between the plastic inner leaf and the masonry outer leaf of the cavity wall, slippage fissures may occur in the area within 300 mm of the blowing hole. These should not be considered as voids, which would constitute a failure.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

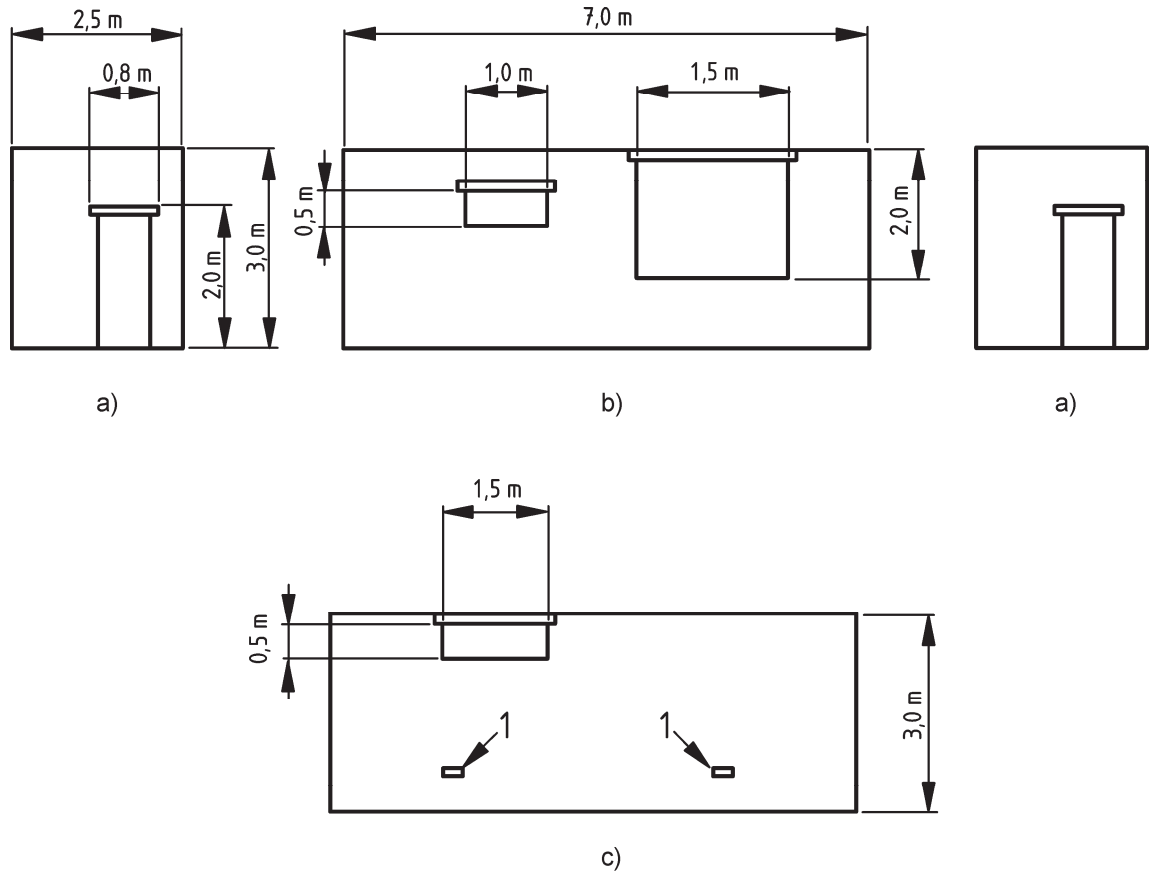
Table L.1 — Installation details

a)	Material type	
b)	Nominal bag weight	
c)	Type of blowing machine	
	Pressure	
	Tray settings	
d)	Delivery hose length	
	Diameter	
e)	Nozzle diameter	

Blowing holes were filled in the sequence indicated on Figure L.1 by the number adjacent to the blowing holes. Blowing times for each hole were as follows:

Table L.2 — Filling procedure

Hole	**Blowing time**		**Hole**	**Blowing time**	
	Min	Sec		Min	Sec
1					
2					
3					
etc.					



Key

a) Side elevation

b) Front elevation

c) Rear elevation

1 Air bricks

Figure L.1 — Test house

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under mandate M/103[1)] given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard, shown in the table below, meet the requirements of the Mandate M/103[1)] given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the construction product covered by this European Standard for its intended uses indicated herein; references shall be made to the information accompanying the CE marking.

WARNING — Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the construction products falling within the scope of this European Standard.

NOTE 1 In addition to the specific clauses relating to dangerous substances contained in this standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (accessed through http://ec.europa.eu/enterprise/construction/internal/dangsub/dangmain_en.htm).

This annex establishes the conditions for the CE marking of the in-situ formed mineral wool intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as Clause 1 of this standard and is defined by Table ZA.1.

1) As amended by mandates M126, M130 and M367.

Table ZA.1 — Relevant clauses

Construction Products: **In-situ formed loose-fill mineral wool (MW) products as covered by the scope of this standard** Intended uses: **Thermal insulation for buildings**			
Requirement/Characteristic from the mandate	**Requirement clauses in this European Standard**	**Mandated classes or levels**	**Notes** [a]
Reaction to fire, Euroclass characteristics	4.2.4 Reaction to fire and Annex F	Euroclasses	—
Water permeability	4.3.3 Water absorption	—	Level
Release of dangerous substances to the indoor environment	4.3.6 Release of dangerous substances	—	—
Thermal resistance	4.2.1 Thermal conductivity 4.2.1 Insulation thickness	— —	Levels
Water vapour permeability	4.3.4 Water vapour transmission	—	Level
Continuous glowing combustion	4.3.7 Continuous glowing combustion	-	-
Durability of reaction to fire against ageing/degradation	— [b]	—	b
Durability of thermal resistance against, ageing/degradation	4.2.1 Thermal resistance and thermal conductivity 4.2.3 Settlement	— —	c Classes

a The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option "No performance determined" (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level (thermal resistance (thermal conductivity and thickness)).

b The fire performance of mineral wool does not detoriate with time. The Euroclass classification of the product is related to the organic content, which cannot increase with time.

c Thermal conductivity of mineral wool products does not change with time, experience has shown the fibre structure to be stable and the porosity contains atmospheric air.

ZA.2 Procedures for attestation of conformity of in-situ formed loose-fill mineral wool (MW) products

ZA.2.1 Systems of attestation of conformity

For products having more than one of the intended uses specified in the following families, the tasks for the approved body, derived from the relevant systems of attestation of conformity, are cumulative.

The system of attestation of conformity for the loose-fill mineral wool (MW) products intended to be formed in-situ, indicated in Table ZA.1 in accordance with the decision of the European Commission 95/204/EC of 30.04.95 revised by decision 99/91/EC of 25.01.99 amended by the decision 01/596/EC of 8 January and as given in Annex III of the mandate M103 as amended by mandates M126 and M130 is shown in Table ZA.2 for the indicated intended use(s).

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table ZA.2 — System(s) of attestation of conformity

Product(s)	Intended use(s)	Level(s) or class(es) (reaction to fire)	Attestation of conformity system(s)
Thermal insulation products (Products intended to be formed in-situ)	For uses subject to regulations on reaction to fire	A1[a], A2[a], B[a], C[a]	1
		A1[b], A2[b], B[b], C[b], D, E	3
		(A1 to E)[c], F	3 (with 4 for RtF)
	Any	—	3
System 1: See Directive 89/106/EEC (CPD) Annex III.2.(i), without audit testing of samples.			
System 3: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Second possibility.			
System 4: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Third possibility.			

[a] Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retarders or a limiting of organic material).

[b] Products/materials not covered by footnote [a].

[c] Products/materials that do not require to be tested for reaction to fire e.g. (Products/materials of classes A1 according to the Decision 96/603/EC, as amended).

The system of attestation of conformity for the CE marking of the product is defined in accordance with Annex ZA (see ZA.2.1). For mineral wool (MW) products the footnote [a] of Table ZA.2 applies except when it can be demonstrated to the notified body for a particular product that no stage in the production process will result in an improvement of the reaction to fire classification (see Table ZA.2, footnote [b]).

The attestation of conformity of the factory made mineral wool products in Table ZA.1 shall be based on the evaluation of conformity procedures indicated in Tables ZA.3 to ZA.4 resulting from application of the clauses of this or other European Standard indicated therein.

Where more than one table applies for the product (i.e. because its intended use makes different characteristics relevant), Table ZA.3 has to be read in conjunction with subsequent tables in order to determine which characteristics assigned to the manufacturer in Table ZA.3 are type tested by a notified test lab (system 3) and which by the manufacturer (system 4).

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

Table ZA.3 — Assignment of evaluation of conformity tasks for products under system 1

Tasks		Content of the task	Evaluation of conformity clauses of EN 13172 to apply in addition to Clause 7 and Annex C of this standard
Tasks for the manufacturer	Factory production control FPC	Parameters related to all relevant characteristics of Table ZA.1	Clauses 1 to 5 and Annexes B and C of EN 13172:2008 7.3 of this standard
	Further testing of samples taken at factory	All relevant characteristics of Table ZA.1	Annex B of this standard
	Initial type testing	Those relevant characteristics of Table ZA.1 not tested by the notified body	Clause 6 of EN 13172:2008 7.2 of this standard
Tasks for the product certification body	Initial type testing	a) Reaction to fire b) Thermal resistance 1) Release of dangerous substances [a] 2) Water absorption	Clause 6 of EN 13172:2008 7.2 of this standard
	Initial inspection of factory and of FPC	Parameters related to all relevant characteristics of Table ZA.1, in particular reaction to fire	Annexes B and C of EN 13172:2008 7.3 of this standard
	Continuous surveillance, assessment and approval of FPC	Parameters related to all relevant characteristics of Table ZA.1, in particular reaction to fire	Annexes B and C of EN 13172:2008 7.3 of this standard

[a] No test method available as yet.

Table ZA.4 — Assignment of evaluation of conformity tasks for products under system 3 or system 3 combined with system 4 for reaction to fire

Tasks		Content of the task	Evaluation of conformity clauses of EN 13172 to apply in addition to Clause 7 and Annex B of this standard
Tasks under the responsibility of the manufacturer	Factory production control FPC	Parameters related to all relevant characteristics of Table ZA.1	Annex C of this standard and Clauses 1 to 5 of EN 13172:2008 and: For system 3: Annex C For system 3 (with 4 for RtF): Annexes C and D of EN 13172:2008
	Initial type testing by the manufacturer	"Those relevant characteristics of Table ZA.1 not tested by the notified body" including reaction to fire for system 3 and 4	Clause 6 of EN 13172:2008 7.2 of this standard
	Initial type testing by a notified test laboratory	— Reaction to fire (system 3) — Thermal resistance — Release of dangerous substances [a] — Water absorption	Clause 6 of EN 13172:2008 7.2 of this standard
[a] No test method available as yet.			

ZA.2.2 EC certificate and declaration of conformity

(In case of products under system 1): When compliance with the conditions of this annex is achieved, the certification body shall draw up a certificate of conformity (EC Certificate of conformity), which entitles the manufacturer to affix of the CE marking. The certificate shall include:

— name, address and identification number of the certification body;

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use, etc.);

— provisions to which the product conforms (e.g. Annex ZA of this EN);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);

— the number of the certificate;

— conditions and period of validity of the certificate, where applicable;

— name of, and position held by, the person empowered to sign the certificate.

In addition the manufacturer shall draw up a declaration of conformity (EC Certificate of conformity) including the following:

— name and address of the manufacturer, or his authorised representative established in the EEA;

— name and address of the certification body;

— description of the product (type, identification, use, etc.) and a copy of the information accompanying the CE marking;

NOTE 2 Where some of the information required for the declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (e.g. Annex ZA of this EN);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);

— the number of the EC Certificate of conformity;

— name of, and position held by, the person empowered to sign the certificate on behalf of the manufacturer or his authorised representative.

(In case of products under system 3 or (3 with 4 for RtF)): When compliance with the conditions of this annex is achieved, the manufacturer, or his agent established in the EEA shall prepare and retain a certificate of conformity (EC Certificate of conformity), which entitles the manufacturer to affix of the CE marking. The declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

NOTE 3 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use, etc.) and a copy of the information accompanying the CE marking;

NOTE 4 Where some of the information required for the declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (e.g. Annex ZA of this EN);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);

— name and address of the notified laboratory(ies);

— name of, and position held by, the person empowered to sign the certificate on behalf of the manufacturer or his authorised representative.

The above mentioned declaration and certificate shall be presented in the official language or languages of the Member State in which the product is to be used.

The validity of the declaration/certificate shall be verified at least once a year.

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

ZA.3 CE Marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the product itself, on the accompanying label or on the packaging. The following information shall accompany the CE marking symbol:

— identification number of the certification body (only for products under system 1);

— name or identifying mark and registered address of the producer;

— the last two digits of the year in which the marking is affixed;

— number of the EC Declaration of conformity (if relevant);

— reference to this European Standard;

— description of the product: generic name, material, dimensions, etc., and intended use;

— information on those relevant essential characteristics listed in Table ZA.1 which are to be declared presented as:

  standard designation(s) in combination with declared values as described in Clause 6.

The "No performance determined" (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

Figure ZA.1 gives an example of the information to be given on the product, label, packaging and/or commercial documents.

CE marking for in-situ formed loose-fill mineral wool products shall be accompanied by the information shown below:

CE "0123"	*CE conformity marking, consisting of the "CE"-symbol given in directive 93/68/EEC.* *Identification number of the certification body (for products under system 1)*
Any Mineral wool Manufacturer 10 0123-CPD-00234	*Name or identifying mark and registered address of the producer* *Last two digits of the year for affixing the marking (ITT)* *Certificate number (for products under system 1)*
EN 14064-1:2010 AMWM Blowing Wool Reaction to fire – A1/s1/d0 Thermal conductivity: See Performance Chart Glowing combustion: NPD Designation code: MW EN 14064-1-S1-WS-MU1	*No. of dated version of European Standard* *Description of product* *and* *information on regulated characteristics* *Designation code (in accordance with Clause 6 of this standard for the relevant characteristics according to Table ZA.1)*

Optional information not part of the CE marking, e.g. Reaction to fire data corresponding to any end-use application configurations given in Annex G*

Figure ZA.1 — Example CE marking information

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE 1 European legislation without national derogation need not be mentioned.

NOTE 2 Affixing the CE marking symbol means, if a product is subject to more than one directive, that it complies with all applicable directives.

Bibliography

[1] EN 12524:2000, *Building materials and products — Hygrothermal properties — Tabulated design values*

[2] EN 14064-2, *Thermal insulation products for buildings — In-situ formed loose-fill mineral wool (MW) products — Part 2: Specification for the installed products*

[3] ISO 12491, *Statistical methods for quality control of building materials and components*

[4] Commission Decision of 4 October 1996 establishing the list of products belonging to Classes A "No contribution to fire" provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products

[5] Commission Decision of 26 September 2000 amending Decision 96/603/EC establishing the list of products belonging to Classes A "No contribution to fire" provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products

Licensed copy: Lee Shau Kee Library, HKUST, Version correct as of 03/01/2015, (c) The British Standards Institution 2013

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™