

Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification

The European Standard EN 13162:2001 has the status of a
British Standard

ICS 91.100.60

National foreword

This British Standard is the official English language version of EN 13162:2001, including corrigendum December 2005.

EN 13162 is a “harmonized” European Standard and fully takes into account the requirements of the European Commission mandate M/103, *Thermal insulating materials and products*, given under the EU Construction Products Directive (89/106/EEC), and intended to lead to CE marking. The date of applicability of EN 13162 as a “harmonized” European Standard, i.e. the date after which this standard may be used for CE marking purposes, is subject to an announcement in the *Official Journal of the European Communities*.

EN 13162 is the subject of transitional arrangements agreed under the European Commission mandate. The Member States have agreed a nominal transition period following the date of availability for the co-existence of EN 13162 and their corresponding national standard(s). It is intended that this period will comprise a nominal nine month period during which any required changes to national regulations are to be made, followed by a further 12 month period for the implementation of CE marking. By the end of this co-existence period, any conflicting national standards will be withdrawn or amended to remove conflicts. In the UK, these corresponding national standards are:

- BS 5803-1:1985, *Thermal insulation for use in pitched roof spaces in dwellings — Part 1: Specification for man-made mineral fibre thermal insulation mats*;
- BS 6676-1:1986, *Thermal insulation of cavity walls using man-made mineral fibre batts (slabs) — Part 1: Specification for man-made mineral fibre batts (slabs)*;
- BS 6676-2:1986, *Thermal insulation of cavity walls using man-made mineral fibre batts (slabs) — Part 2: Code of practice for installation of batts (slabs) filling the cavity*;

and based on this nominal transition period of 21 months, BS 5803-1:1985, BS 6676-1:1986 and BS 6676-2:1986 will be withdrawn or amended at the latest by March 2003.

The UK participation in the preparation of EN 13162:2001 was entrusted by Technical Committee B/540, Energy performance of materials, components and buildings, to Subcommittee B/540/6, Fibrous and inorganic thermal insulation materials, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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

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Summary of pages

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English version

Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification

Produits isolants thermiques pour le bâtiment — Produits manufacturés en laine minérale (MW) — Spécification

Wärmedämmstoffe für Gebäude — Werkmäßig hergestellte Produkte aus Mineralwolle (MW) — Spezifikation

This European Standard was approved by CEN on 16 April 2001.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This European Standard 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 November 2001, and conflicting national standards shall be withdrawn at the latest by March 2003.

This European Standard 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 standard.

This European Standard contains five annexes:

Annex A (normative) Determination of the declared values of thermal resistance and thermal conductivity;
Annex B (normative) Factory production control;
Annex C (informative) Additional properties;
Annex D (informative) Examples for the determination of the declared values of thermal resistance and thermal conductivity for a product or a product group;
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 of standards for insulation products used in buildings but this standard may be used in other areas where appropriate.

In pursuance of Resolution BT 20/1993 revised, CEN/TC 88 have proposed defining the standards listed below as a package of European Standards, setting (21 months after availability) as the date of withdrawal (dow) of national standards which conflict with the European Standards of this package.

The package of standards comprises the following group of interrelated standards for the specifications of factory made thermal insulation products, all of which come within the scope of CEN/TC 88:

EN 13162, *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification.*

EN 13163, *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification.*

EN 13164, *Thermal insulation products for buildings — Factory made products of extruded polystyrene foam (XPS) — Specification.*

EN 13165, *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PUR) products — Specification.*

EN 13166, *Thermal insulation products for buildings — Factory made products of phenolic foam (PF) — Specification.*

EN 13167, *Thermal insulation products for buildings — Factory made cellular glass (CG) products — Specification.*

EN 13168, *Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification.*

EN 13169, *Thermal insulation products for buildings — Factory made products of expanded perlite (EPB) — Specification.*

EN 13170, *Thermal insulation products for buildings — Factory made products of expanded cork (ICB) — Specification.*

EN 13171, *Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the requirements for factory made mineral wool products, with or without facings, which are used for the thermal insulation of buildings. The products are manufactured in the form of rolls, batts, boards or slabs.

This standard describes product characteristics and includes procedures for testing, evaluation of conformity, marking and labelling.

Products covered by this standard are also used in prefabricated thermal insulation systems and composite panels; the performance of systems incorporating these products is not covered.

This standard does not specify the required level of a given property to be achieved by a product to demonstrate fitness for purpose in a particular application. The levels required for a given application are to be found in regulations or non-conflicting standards.

Products with a declared thermal resistance lower than 0,25 m² K/W or a declared thermal conductivity greater than 0,060 W/(m·K) at 10 °C are not covered by this standard.

This standard does not cover in situ insulation products and products intended to be used for the insulation of building equipment and industrial installations.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 354:1993/A1, *Acoustics — Measurement of sound absorption in a reverberation room — Amendment 1: Test specimen mountings for sound absorption tests* (ISO 354:1985/AMD 1:1997).

EN 822, *Thermal insulating products for building applications — Determination of length and width.*

EN 823, *Thermal insulating products for building applications — Determination of thickness.*

EN 824, *Thermal insulating products for building applications — Determination of squareness.*

EN 825, *Thermal insulating products for building applications — Determination of flatness.*

EN 826, *Thermal insulating products for building applications — Determination of compression behaviour.*

prEN ISO 1182, *Reaction to fire tests for building products — Non-combustibility test* (ISO/DIS 1182:1998).

EN 1604, *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions.*

EN 1606, *Thermal insulating products for building applications — Determination of compressive creep.*

EN 1607, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces.*

EN 1608, *Thermal insulating products for building applications — Determination of tensile strength parallel to faces.*

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

prEN ISO 1716, *Reaction to fire tests for building products — Determination of calorific value (ISO/DIS 1716:1998).*

prEN ISO 9229, *Thermal insulation — Definitions of terms (ISO/DIS 9229:1997).*

EN ISO 11654, *Acoustics — Sound absorbers for use in buildings — Rating of sound absorption (ISO 11654:1997).*

prEN ISO 11925-2, *Reaction to fire tests for building products — Part 2: Ignitability when subjected to direct impingement of flame (ISO/DIS 11925-2:1998).*

EN 12086:1997, *Thermal insulating products for building applications — Determination of water vapour transmission properties.*

EN 12087, *Thermal insulating products for building applications — Determination of long-term water absorption by immersion.*

EN 12430, *Thermal insulating products for building applications — Determination of the behaviour under point load.*

EN 12431, *Thermal insulating products for building applications — Determination of thickness for floating floor insulation products.*

prEN 12667, *Building materials — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance.*

EN 12939, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Thick products of high and medium thermal resistance.*

EN 13172:2001, *Thermal insulating products — Evaluation of conformity.*

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

prEN 13820, *Thermal insulating products for building applications — Determination of organic content.*

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

EN 29052-1, *Acoustics — Determination of dynamic stiffness — Part 1: Materials used under floating floors in dwellings.*

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

ISO 12491, *Statistical methods for quality control of building materials and components.*

3 Terms, definitions, symbols, units and abbreviated terms

3.1 Terms and definitions

For the purpose of this standard, the following terms and definitions apply:

3.1.1 Terms and definitions as given in prEN ISO 9229

3.1.1.1

mineral wool

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

3.1.1.2

batt

portion of a mat in the form of a rectangular piece, generally between 1 m and 3 m in length, and usually supplied flat or folded

3.1.1.3

roll

(insulation) product supplied in the form of a spirally wound cylinder

3.1.1.4

board; slab

rigid or semi-rigid (insulation) product of rectangular shape and cross section in which the thickness is uniform and substantially smaller than the other dimensions

NOTE Boards are usually thinner than slabs. They may also be supplied in tapered form.

3.1.2 Additional terms and definitions

3.1.2.1

level

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

3.1.2.2

class

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

3.1.2.3

mat; blanket

flexible fibrous insulation product supplied rolled or flat, which may be faced or enclosed

3.2 Symbols, units and abbreviated terms

Symbols and units used in this standard:

α_p	is the practical sound absorption coefficient	—
α_w	is the weighted sound absorption coefficient	—
b	is the width	mm
c	is the compressibility	mm
d	is the thickness	mm
d_B	is the thickness under a load of 2 kPa after removal of an additional load of 48 kPa	mm
d_L	is the thickness under a load of 250 Pa	mm
d_N	is the nominal thickness of the product	mm
$\Delta\epsilon_b$	is the relative change in width	%
$\Delta\epsilon_d$	is the relative change in thickness	%
$\Delta\epsilon_l$	is the relative change in length	%
$\Delta\epsilon_s$	is the relative change in flatness	mm/m
F_p	is the point load at a given deformation	N
k	is a factor related to the number of test results	—
l	is the length	mm
λ	is the thermal conductivity	W/(m·K)
$\lambda_{90/90}$	is a 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)
μ	is the water vapour diffusion resistance factor	—
n	is the number of test results	—
$R_{90/90}$	is a 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
R_{mean}	is the mean thermal resistance	m ² ·K/W
S_b	is the deviation from squareness of the edge on length and width	mm/m
S_{max}	is the deviation from flatness	mm
s_R	is the estimate of the standard deviation of the thermal resistance	m ² ·K/W
s_λ	is the estimate of the standard deviation of the thermal conductivity	W/(m·K)
s'	is the dynamic stiffness	MN/m ³
σ_{10}	is the compressive stress at 10 % deformation	kPa
σ_c	is the compressive stress	kPa
σ_m	is the compressive strength	kPa
σ_{mt}	is the tensile strength perpendicular to faces	kPa
σ_t	is the tensile strength parallel to faces	kPa
W_{lp}	is the long term water absorption by partial immersion	kg/m ²
W_p	is the short term water absorption	kg/m ²
X_0	is the initial deformation after 60 s from the beginning of loading	mm
X_{ct}	is the compressive creep	mm
X_t	is the total thickness reduction at time t	mm
Z	is the water vapour resistance	m ² ·h·Pa/mg
AF _r	is the symbol of level air flow resistivity	
AP	is the symbol of the declared level of practical sound absorption coefficient	
AW	is the symbol of the declared level of weighted sound absorption coefficient	
CC($i_1/i_2/y$) σ_c	is the symbol of the declared level for compressive creep	
CP	is the symbol of the declared level for compressibility	
CS(10\Y)	is the symbol of the declared level for compressive stress or compressive strength	
DS(T+)	is the symbol of the declared value for dimensional stability at specified temperature	

DS(TH)	is the symbol of the declared value for dimensional stability under specified temperature and relative humidity conditions
MU	is the symbol of the declared value for water vapour diffusion resistance factor
PL(5)	is the symbol of the declared level of point load for 5 mm deformation
SD	is the symbol of the declared level of dynamic stiffness
T	is the symbol of the declared class or level for thickness tolerances
TR	is the symbol of the declared level for tensile strength perpendicular to faces
WL(P)	is the symbol of the declared level for long term water absorption by partial immersion
WS	is the symbol of the declared level for short term water absorption
Z	is the symbol of the declared value for water vapour resistance

Abbreviated terms used in this standard:

MW is **Mineral Wool**
ITT is **Initial Type Test**

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.

NOTE Information on additional properties is given in annex C.

One test result for a product property is the average of the measured values on the number of test specimens given in Table 4.

4.2 For all applications

4.2.1 Thermal resistance and thermal conductivity

Thermal resistance and thermal conductivity shall be based upon measurements carried out in accordance with prEN 12667 or EN 12939 for thick products.

The thermal resistance and thermal conductivity 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;
- for products of uniform thickness the thermal resistance, R_D , shall always be declared. The thermal conductivity, λ_D , shall be declared where possible. Where appropriate, for products of non-uniform thickness (i.e. for sloped and tapered products) only the thermal conductivity, λ_D , shall be declared;
- the thermal resistance, R_D , and 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 as λ_D in levels with steps of 0,001 W/(m·K);
- the declared thermal resistance, R_D , shall be calculated from the nominal thickness, d_N , and the corresponding thermal conductivity, $\lambda_{90/90}$, unless measured directly;
- the value of thermal resistance, $R_{90/90}$, when calculated from the nominal thickness, d_N , and the corresponding thermal conductivity, $\lambda_{90/90}$, shall be rounded downwards to the nearest 0,05 m²·K/W, and declared as R_D in levels with steps of 0,05 m²·K/W;