

Thermal insulation products for building equipment and industrial installations — Determination of maximum service temperature

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British Standard

ICS 91.100.60

National foreword

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 20, an inside back cover and a back cover.

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English Version

Thermal insulation products for building equipment and industrial installations - Determination of maximum service temperature

Produits isolants thermiques pour l'équipement du bâtiment
et les installations industrielles - Détermination de la
température maximale de service

Wärmedämmstoffe für die Haustechnik und für
betriebstechnische Anlagen - Bestimmung der oberen
Anwendungsgrenztemperatur

This European Standard was approved by CEN on 27 October 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Contents

Page

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Principle.....	4
5 Apparatus	5
6 Test specimens	6
7 Procedure	7
8 Calculation and expression of results.....	8
9 Accuracy of measurement	10
10 Test report	10
Annex A (normative) Modifications of and additions to the general test method for mineral wool products.....	12
Annex B (normative) Modifications of and additions to the general test method for cellular glass products.....	15
Annex C (normative) Modifications of and additions to the general test method for phenolic foam products.....	16
Annex D (normative) Modifications of and additions to the general test method for polyethylene foam (PEF) and flexible elastomeric foam (FEF) products	18
Bibliography	20

Foreword

This European Standard (EN 14706:2005) 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 June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This European Standard is one of a series of standards which specify test methods for determining dimensions and properties of thermal insulating materials and products. It supports a series of product standards for thermal insulating materials and products which derive from the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (Directive 89/106/EEC) through the consideration of the essential requirements.

This standard contains the following 4 normative annexes:

- Annex A — Modifications of and additions to the general test method for mineral wool products
- Annex B — Modifications of and additions to the general test method for cellular glass products
- Annex C — Modifications of and additions to the general test method for phenolic foam products
- Annex D — Modifications of and additions to the general test method for polyethylene foam and flexible elastomeric foam products

This European Standard has been prepared for products used to insulate building equipment and industrial installations, but it may also be applied to products used in other areas.

A similar standard is available for testing of preformed pipe insulation EN 14707 *Thermal insulating products for building equipment and industrial installations — Determination of maximum service temperature for preformed pipe insulation*.

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

1 Scope

This European Standard specifies the equipment and procedures for determining the maximum service temperature of flat insulation products. It is applicable to thermal insulating products.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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 12085, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens.*

EN 12429, *Thermal insulating products for building applications — Conditioning to moisture equilibrium under specified temperature and humidity conditions.*

ISO 7884-1, *Glass — Viscosity and viscometric fixed points — Part 1: Principles for determining viscosity and viscometric fixed points.*

ISO 7884-7, *Glass — Viscosity and viscometric fixed points — Part 7: Determination of annealing point and strain by beam bending.*

3 Terms and definitions

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

3.1

Maximum service temperature

highest temperature to which a thermal insulation product may be exposed at a given thickness and at which it will continue to function within specified limits of performance

[prEN ISO 9229]

NOTE 1 The required performance may be in the areas of dimensional stability, thermal properties, and mechanical properties as well as changes in appearance and resistance against creation of hazards such as internal self heating (see Annexes A and C and possible requirements in the relevant product standard).

NOTE 2 In the present test procedure, which is used as a reference, the test specimen is exposed to a temperature difference going from ambient to the maximum service temperature. This may not reflect the actual application conditions when products are exposed to different temperatures on the two main faces, e.g. in multilayer systems or for faced products where the facing may limit the maximum service temperature.

4 Principle

Measure thickness, length, and width after one sided heat treatment for a specified time period, at the maximum service temperature, achieved using a specified rate of temperature increase. The thickness of the test specimen is measured during heat treatment, and the length and width only after cooling to ambient temperature.

NOTE The procedure may be an iterative process.

Additional requirements for assessing the maximum service temperature of specific materials are described in normative annexes to this European Standard or the relevant product standard or any other European Technical Specification.

5 Apparatus

A general arrangement of the apparatus is indicated in figure 1 and comprises:

5.1 Flat square or circular hot plate, with a uniform temperature distribution in the measuring zone on the hot face and a heat flux perpendicular to the face of the hot plate. The deviation from flatness of the hot plate shall not exceed 1 mm in the measuring zone at ambient temperature.

The hot plate shall be capable of being controlled to within $\pm 2\%$ of a predetermined temperature or $\pm 10\text{ }^{\circ}\text{C}$ whichever is smaller.

The hot plate shall be capable of being heated at $50\text{ }^{\circ}\text{C/h}$ and/or $300\text{ }^{\circ}\text{C/h}$.

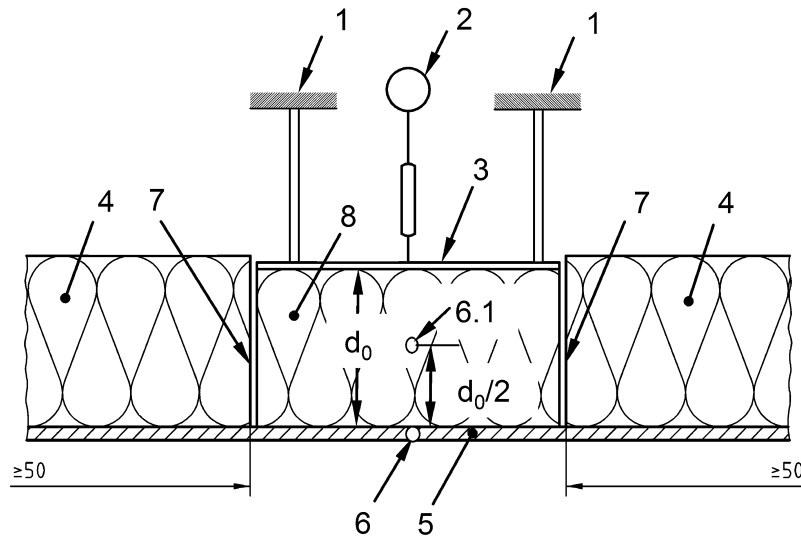
5.2 Edge insulation, with a gap as small as possible (e.g. $\leq 1\text{ mm}/100\text{ mm}$ test specimen size) which will permit free movement during the test of the test specimen and of the pressure plate.

5.3 Square or circular pressure plate, with the same dimensions as the test specimen exerting the required load on the test specimen.

5.4 Device, e.g. electromechanical for measuring the thickness of the test specimen during the test to the nearest 0,1 mm.

When determining the thickness of the test specimen the thermal movement of the apparatus (e. g. quartz rod) shall be taken into account up to the maximum service temperature.

5.5 Temperature sensors (e.g. thermocouples) capable of recording the hot plate temperature to the nearest $\pm 1\%$ in centigrade but not less than $\pm 1\text{ }^{\circ}\text{C}$, which are placed within grooves on the hot plate.



Key

- | | |
|---|----------------|
| 1 Device for measuring thickness, e.g. electromechanical device | 5 Hot plate |
| 2 Test specimen | 6 Thermocouple |
| 3 Pressure plate | 7 Small gap |
| 4 Edge insulation | |

Figure 1 — Example of an apparatus for determining maximum service temperature

6 Test specimens

6.1 Dimensions of test specimens

Length and width: Test specimens shall be cut as squares or cylinders (as appropriate) and the cross section dimensions shall be as follows:

100 mm × 100 mm (or diameter 100 mm) or

150 mm × 150 mm (or diameter 150 mm) or

200 mm × 200 mm (or diameter 200 mm) or

300 mm × 300 mm (or diameter 300 mm)

Thickness: The thickness shall be 100 mm or the largest thickness below 100 mm available.

The length and width or diameter shall be as specified in the relevant product standard or in annexes to this European Standard.

NOTE 1 In the absence of a product standard or any other European Technical Specification the dimensions may be agreed between parties.

NOTE 2 Testing may be performed on multilayer systems to simulate the conditions existing in the application.