



SLOVENSKI STANDARD
SIST EN 13165:2002/A2:2005
01-februar-2005

Toplotnoizolacijski proizvodi za stavbe - Proizvodi iz trde poliuretanske pene (PUR) – Specifikacija

Thermal insulation products for buildings - Factory made rigid polyurethane foam (PUR) products - Specification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte Produkte aus Polyurethan Hartschaum (PUR) - Spezifikation

Produits isolants thermiques pour le bâtiment - Produits manufacturés en mousse rigide de polyuréthane (PUR) - Spécification

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Ta slovenski standard je istoveten z: EN 13165:2001/A2:2004

ICS:

91.100.60 Thermal and sound insulating materials

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ICS 91.100.60

English version

**Thermal insulation products for buildings - Factory made rigid
polyurethane foam (PUR) products - Specification**

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte
Produkte aus Polyurethan Hartschaum (PUR) -
Spezifikation

This amendment A2 modifies the European Standard EN 13165:2001; it was approved by CEN on 30 September 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant 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 amendment 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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Foreword

This document (EN 13165:2001/A2:2004) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This Amendment to the European Standard EN 13165:2001/A2:2004 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This amendment 2 to EN 13165:2001 makes changes and additions to

- the text in Annex C (normative) with deleting hydrochlorofluorocarbon blowing agents 141b and 22/142b and adding new hydrofluorocarbon blowing agents 245fa, 227ea and 365mfc
- and updates the Tables C.1 and C.2 accordingly.

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.

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1 Modification to text of Annex C (normative) Determination of the aged values of thermal resistance and thermal conductivity

1.1 Modification to Clause C.1

Delete C.1 and substitute the following:

C.1 General

This annex describes methods which are used to take account of the ageing effect, which when it occurs is due to changes in the cell gas composition with time. These methods give a prediction of the time averaged aged value over 25 years.

The determination of the aged value shall be made either by the direct measurement method (accelerated ageing procedure, C.4) or by a combination of the normality test and the calculation method (fixed increment procedure, C.5). For both methods the sampling and test specimen preparation procedure shall be as described in C.2.

NOTE See Figure C.1 for a flow chart of the alternative ageing procedures.

The ageing methods are valid for closed cell PUR products produced by using high molecular weight blowing agents such as hydrocarbons (namely pentanes) and hydrofluorocarbons (namely: HFC 134a, 245fa, 227ea, 365mfc), which substantially stay in the products for time periods well in excess of those required for an economically reasonable life. These blowing agents are therefore called 'permanent'. They can be used mixed together with each other and with carbon dioxide (CO₂). CO₂ is a 'non-permanent' blowing agent, which may readily diffuse out of the product. Ageing of the thermal properties of PUR products is therefore predominantly caused by the inward diffusion of air into the product and outward diffusion of CO₂, if diffusion tight facings do not prevent both.

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PUR products blown only with CO₂ are also covered by these ageing methods.

For mixtures of permanent blowing agents the following procedures shall be followed:

- if the accelerated ageing procedure of C.4 is used, the safety increment in accordance with table C.1 for that blowing agent in the mixture with the highest value shall be used;
- if the fixed increment procedure of C.5 is used, the normality test shall be performed first. The result from the normality test will give the decision, which increment shall be taken. If the test result is not higher than the required limit value in C.5.2 for a certain blowing agent in the mixture, the increment in accordance with Table C.2 for this blowing agent shall be taken to determine the aged value of thermal conductivity.

If new blowing agents are shown to be 'permanent types' (meaning having diffusion coefficients similar to the established values for pentanes and hydrofluorocarbons), the ageing methods defined in this annex can be used. New limit values for the fixed increment procedure (C.5) and different safety increments for the accelerated ageing procedure (C.4) may be required.

1.2 Modification to sub-clause C.5.1

Delete C.5.1 and substitute with the following:

C.5.1 Conditions

The fixed increment procedure described below shall only be used if:

- the product has fulfilled the requirements of the normality test given in C.5.2, except for CO₂ blown only products;

- CO₂ blown only products have a closed cell content, determined according to ISO 4590, of not less than 90 %;
- the product contains any of the blowing agents such as pentanes and/or hydrofluorocarbons or a mixture of these with CO₂, or only CO₂;
- for products with diffusion tight facings, these facings shall consist of a metal sheet with thickness not less than 50 µm or the facings shall show an equivalent performance. Faced products, which do not show an increase of the thermal conductivity of more than 0,001 W/(m·K) when tested for (175 ± 5) days at (70 ± 2) °C are considered to be covered with diffusion tight facings (maximum size of the sample 800 mm x 800 mm and maximum thickness 50 mm);

NOTE 1 The diffusion tight property of a facing can also be proven, if the oxygen diffusion level is less than 4,5 ml per 24 h per m² when measured at 20 °C in accordance with ASTM 3985 "Standard test method for oxygen gas transmission rate through plastic film and sheeting using a coulometric sensor, 1995".

- the dimensions of rectangular products which have diffusion tight facings are not less than 600 mm x 800 mm.

NOTE 2 For products with diffusion tight facings which have smaller dimensions than these limit values, either the procedure given in C.4 should be followed or the fixed increments for diffusion open facings given in Table C.2 should be used.

1.3 Modification to sub-clause C.5.2

Delete C.5.2 and substitute with the following:

C.5.2 Normality test

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Products blown with 'permanent' blowing agents shall fulfil the requirements of the following procedure:

- select a product sample (1 to 8 days after manufacture) and condition it for 16 h at (23 ± 3) °C and (50 ± 10) % relative humidity;
- cut a test specimen of minimum dimensions 200 mm length and width × 20₀⁺² thickness from the central area of the product sample;
- determine the initial value of thermal conductivity of the test specimen in accordance with C.3;
- store the test specimen at (70 ± 2) °C for (21 ± 1) days;
- after reconditioning for 16 h at (23 ± 3) °C and (50 ± 10) % relative humidity determine the aged value of thermal conductivity of the test specimen in accordance with EN 12667 and EN 12939 and 5.3.2.

The difference between the aged and the initial values of thermal conductivity shall not be more than 0,0060 W/(m·K) for pentane blown and for 245fa, 227ea, 365mfc blown products and 0,0075 W/(m·K) for 134a blown products.

If the difference is more than the values stated herein, the fixed increment method cannot be used and the aged thermal conductivity shall be obtained in accordance with C.4.

2 Modification to Table C.1

Delete Table C.1 and substitute with the following:

Table C.1 — Safety increments to be added to the measured accelerated aged value of thermal conductivity

| Type of product / facing | Blowing agent technology ^a | Safety increment in $W/(m \cdot K)$ for products with nominal thickness $d_N \leq 80$ mm | Safety increment in $W/(m \cdot K)$ for products with nominal thickness $d_N > 80$ mm |
|---|---|--|---|
| Cut foam without facing | Pentane, HFC 245fa, 227ea, 365mfc | 0,0010 | 0,0020 |
| | HFC 134a | 0,0015 | 0,0025 |
| Faced with diffusion open facings | Pentane, HFC 245fa, 227ea, 365mfc | 0,0010 | 0,0015 |
| | HFC 134a | 0,0015 | 0,0020 |
| Faced with diffusion tight facings ^b | Pentane, HFC 134a, 245fa, 227ea, 365mfc | 0,0010 | 0,0010 |

^a Safety increments for 100 % CO₂ - blown products will be determined when sufficient information is available.

^b See section C.5.1 for the definition of diffusion tight facings.

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