SLOVENSKI STANDARD
SIST EN 14305:2016
01-februar-2016

Nadomešča:

Toplotnoizolacijski proizvodi za opremo stavb in industrijske inštalacije - Proizvodi iz penjenega stekla (CG) - Specifikacija

Thermal insulation products for building equipment and industrial installations - Factory made cellular glass (CG) products - Specification

Wärmedämmstoffe für die technische Gebäudeausrüstung und für betriebstechnische Anlagen in der Industrie - Werkmäßig hergestellte Produkte aus Schaumglas (CG) - Spezifikation

Produits isolants thermiques pour l'équipement du bâtiment et les installations industrielles - Produits manufacturés en verre cellulaire (CG) - Spécification

Ta slovenski standard je istoveten z: EN 14305:2015

ICS:
91.100.60 Materiali za toplotno in zvočno izolacijo Thermal and sound insulating materials

SIST EN 14305:2016 en,fr,de

Thermal insulation products for building equipment and industrial installations - Factory made cellular glass (CG) products - Specification

Produits isolants thermiques pour l’équipement du bâtiment et les installations industrielles - Produits manufacturés en verre cellulaire (CG) - Spécification

Wärmedämmstoffe für die technische Gebäudeausrüstung und für betriebstechnische Anlagen in der Industrie - Werkmäßig hergestellte Produkte aus Schaumglas (CG) - Spezifikation

This European Standard was approved by CEN on 24 October 2015.

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-CENELEC 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-CENELEC 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>European foreword</td>
<td>4</td>
</tr>
<tr>
<td>1  Scope</td>
<td>6</td>
</tr>
<tr>
<td>2  Normative references</td>
<td>6</td>
</tr>
<tr>
<td>3  Terms and definitions</td>
<td>8</td>
</tr>
<tr>
<td>3.1 Terms and definitions</td>
<td>8</td>
</tr>
<tr>
<td>3.1.1 Terms and definitions as given in EN ISO 9229:2007</td>
<td>8</td>
</tr>
<tr>
<td>3.1.2 Additional terms and definitions</td>
<td>9</td>
</tr>
<tr>
<td>3.2 Symbols, units and abbreviated terms</td>
<td>9</td>
</tr>
<tr>
<td>3.2.1 Symbols and units used in this standard</td>
<td>9</td>
</tr>
<tr>
<td>3.2.2 Abbreviated terms used in this standard</td>
<td>11</td>
</tr>
<tr>
<td>4  Requirements</td>
<td>11</td>
</tr>
<tr>
<td>4.1 General</td>
<td>11</td>
</tr>
<tr>
<td>4.2 For all applications</td>
<td>11</td>
</tr>
<tr>
<td>4.2.1 Thermal conductivity</td>
<td>11</td>
</tr>
<tr>
<td>4.2.2 Dimensions and tolerances</td>
<td>12</td>
</tr>
<tr>
<td>4.2.3 Dimensional stability</td>
<td>13</td>
</tr>
<tr>
<td>4.2.4 Reaction to fire classification of the product as placed on the market</td>
<td>13</td>
</tr>
<tr>
<td>4.2.5 Durability characteristics</td>
<td>14</td>
</tr>
<tr>
<td>4.3 For specific applications</td>
<td>14</td>
</tr>
<tr>
<td>4.3.1 General</td>
<td>14</td>
</tr>
<tr>
<td>4.3.2 Maximum service temperature</td>
<td>14</td>
</tr>
<tr>
<td>4.3.3 Minimum service temperature</td>
<td>15</td>
</tr>
<tr>
<td>4.3.4 Compressive strength</td>
<td>15</td>
</tr>
<tr>
<td>4.3.5 Bending strength</td>
<td>16</td>
</tr>
<tr>
<td>4.3.6 Point load</td>
<td>16</td>
</tr>
<tr>
<td>4.3.7 Tensile strength parallel to faces</td>
<td>16</td>
</tr>
<tr>
<td>4.3.8 Tensile strength perpendicular to faces</td>
<td>17</td>
</tr>
<tr>
<td>4.3.9 Compressive creep</td>
<td>17</td>
</tr>
<tr>
<td>4.3.10 Water absorption</td>
<td>17</td>
</tr>
<tr>
<td>4.3.11 Water vapour diffusion resistance</td>
<td>17</td>
</tr>
<tr>
<td>4.3.12 Trace quantities of water soluble ions and the pH-value</td>
<td>18</td>
</tr>
<tr>
<td>4.3.13 Sound absorption</td>
<td>18</td>
</tr>
<tr>
<td>4.3.14 Release of dangerous substances</td>
<td>18</td>
</tr>
<tr>
<td>4.3.15 Continuous glowing combustion</td>
<td>18</td>
</tr>
<tr>
<td>5  Test methods</td>
<td>18</td>
</tr>
<tr>
<td>5.1 Sampling</td>
<td>18</td>
</tr>
<tr>
<td>5.2 Conditioning</td>
<td>18</td>
</tr>
<tr>
<td>5.3 Testing</td>
<td>19</td>
</tr>
<tr>
<td>5.3.1 General</td>
<td>19</td>
</tr>
<tr>
<td>5.3.2 Thermal conductivity</td>
<td>19</td>
</tr>
<tr>
<td>5.3.3 Reaction to fire</td>
<td>21</td>
</tr>
<tr>
<td>6  Designation code</td>
<td>22</td>
</tr>
<tr>
<td>7  Assessment and Verification of the Constancy of Performance (AVCP)</td>
<td>22</td>
</tr>
<tr>
<td>7.1 General</td>
<td>22</td>
</tr>
<tr>
<td>7.2 Product Type Determination (PTD)</td>
<td>23</td>
</tr>
</tbody>
</table>
7.3 Factory Production Control (FPC) ................................................................. 23
8 Marking and labelling .......................................................................................... 23
Annex A (normative) Factory production control ....................................................... 24
Annex B (normative) Determination of minimum service temperature ...................... 27
B.1 Definitions ........................................................................................................ 27
B.2 Principle ............................................................................................................ 27
B.3 Apparatus .......................................................................................................... 27
B.4 Test specimens .................................................................................................. 28
B.5 Procedure ......................................................................................................... 28
B.6 Calculation and expression of results ................................................................. 29
B.7 Accuracy of measurements ................................................................................ 29
B.8 Test report ........................................................................................................ 30
Annex C (informative) Additional properties ......................................................... 31
C.1 General ............................................................................................................. 31
C.2 Fire protection .................................................................................................. 31
C.3 Compressive strength ....................................................................................... 31
C.4 Shear strength .................................................................................................. 31
C.5 Dimensional stability under constant normal laboratory conditions .................. 31
C.6 Coefficient of thermal expansion ...................................................................... 32
C.7 Apparent density ............................................................................................... 32
Annex D (informative) Preparation of the flat test specimens to measure thermal conductivity .................................................................................................................. 33
D.1 Introduction ..................................................................................................... 33
D.2 Procedure to get flat test specimen faces: method of the three rulers ............... 33
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation ................................................................. 34
ZA.1 Scope and relevant characteristic .................................................................... 34
ZA.2 Procedures for AVCP of factory made cellular glass products ....................... 35
ZA.3 CE Marking and labelling ............................................................................... 43
Bibliography ........................................................................................................... 45
European foreword

This document (EN 14305:2015) 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 2016, and conflicting national standards shall be withdrawn at the latest by September 2017.

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 is identifying those clauses of the standard which are needed for the compliance of the European Standard with the Construction Products Regulation (CPR).

The main technical changes that have been made in this new edition of EN 14305 are the following:

a) an addition to the foreword;
b) an addition in 3.2.2;
c) a new 4.3.14;
d) modification of 5.3.2;
e) modification of Clause 7;
f) modification of Clause 8;
g) modification of Annex A;
h) a new Annex ZA.

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 Regulation (EU) No. 305/2011.

For relationship with Regulation (EU) No. 305/2011, see informative Annex ZA, which is an integral part of this document.

Locally responsible authorities and contracting entities, who are bound by EU Directives to specify their requirements using European harmonized product standards, are allowed to demand additional properties outside the provisions of this standard if this is technically necessary because of prevailing operational conditions of the building equipment or the industrial installation projected or because of safety regulations.

This European Standard contains four annexes:

— Annex A (normative), Factory production control;
— Annex B (informative), Determination of minimum service temperature;
— Annex C (informative), Additional properties;
EN 14305:2015 (E)

This document includes a bibliography.

This European Standard is one of a series of standards for insulation products used in building equipment and industrial installations, but this standard can 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 European package of 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 14303, Thermal insulation products for building equipment and industrial installations — Factory made mineral wool (MW) products — Specification

EN 14304, Thermal insulation products for building equipment and industrial installations — Factory made flexible elastomeric foam (FEF) products — Specification

EN 14305, Thermal insulation products for building equipment and industrial installations — Factory made cellular glass (CG) products — Specification

EN 14306, Thermal insulation products for building equipment and industrial installations — Factory made calcium silicate (CS) products — Specification

EN 14307, Thermal insulation products for building equipment and industrial installations — Factory made extruded polystyrene foam (XPS) products — Specification

EN 14308, Thermal insulation products for building equipment and industrial installations — Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products — Specification

EN 14309, Thermal insulation products for building equipment and industrial installations — Factory made products of expanded polystyrene (EPS) — Specification

EN 14313, Thermal insulation products for building equipment and industrial installations — Factory made polyethylene foam (PEF) products — Specification

EN 14314, Thermal insulation products for building equipment and industrial installations — Factory made phenolic foam (PF) products — Specification

EN 15501, Thermal insulation products for building equipment and industrial installations — Factory made expanded perlite (EP) and exfoliated vermiculite (EV) 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, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.
1 Scope

This European Standard specifies the requirements for factory made cellular glass products which are used for the thermal insulation of building equipment and industrial installations with an operating temperature range of approximately -265 °C to +430 °C.

Below an operating temperature of -50 °C, special tests regarding the suitability of the product in the intended application are advised (e.g. liquefaction of oxygen). Manufacturer’s advice should be heeded in all cases.

The products are manufactured in the form of faced or unfaced boards, pipe sections, segments and prefabricated ware.

This European 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 European Standard does not specify the required level of a given property that should be achieved by a product to demonstrate fitness for purpose in a particular application. The levels required for a given application can be found in regulations and invitations to tender.

Products with a declared thermal conductivity greater than 0,065 W/(m·K) at 10 °C are not covered by this standard.

This European Standard does not cover products for the insulation of the building structure.

2 Normative references

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

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 826:2013, Thermal insulating products for building applications - Determination of compression behaviour

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
EN 12085, Thermal insulating products for building applications - Determination of linear dimensions of test specimens

EN 12086:2013, 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 12089, Thermal insulating products for building applications - Determination of bending behaviour

EN 12430, Thermal insulating products for building applications - Determination of behaviour under point load

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 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 13172:2012, Thermal insulation products - Evaluation of conformity

EN 13467, Thermal insulating products for building equipment and industrial installations - Determination of dimensions, squareness and linearity of preformed pipe insulation

EN 13468, Thermal insulating products for building equipment and industrial installations - Determination of trace quantities of water soluble chloride, fluoride, silicate, sodium ions and pH

EN 13472, Thermal insulating products for building equipment and industrial installations - Determination of short term water absorption by partial immersion of preformed pipe insulation


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 14706, Thermal insulating products for building equipment and industrial installations - Determination of maximum service temperature

EN 14707, Thermal insulating products for building equipment and industrial installations - Determination of maximum service temperature for preformed pipe insulation

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


EN ISO 1182, Reaction to fire tests for products - Non-combustibility test (ISO 1182:2010)
3 Terms and definitions

3.1 Terms and definitions

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

3.1.1 Terms and definitions as given in EN ISO 9229:2007

For the purposes of this document, most of the terms and definitions given in EN ISO 9229:2007 apply.

3.1.1.1 cellular glass
rigid insulation material made from expanded glass with a closed-cell structure

3.1.1.2 faced cellular glass board
board of cellular glass with facing(s) with a maximum of 3 mm on one or two faces which may be roofing felt or metal foil or paper, cardboard, plastic foil, rendering or similar materials

Note 1 to entry: The core may consist of either one board, a part of a board or a number of boards bonded edge to edge in the factory, with an appropriate adhesive.

Note 2 to entry: Bitumen is a suitable adhesive which may be used to bond both the joints and the facings. Of course there are alternative adhesives available depending the end use.

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

Note 1 to entry: 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

Note 1 to entry: 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 pipe section
section
(insulation) product in the shape of a cylindrical annulus which may be split to facilitate application

3.1.2.4 lag
segment
rigid or semi-rigid insulation product for application to large diameter cylindrical or spherical equipment

3.1.2.5 block
billet
(insulation) product generally of rectangular cross section and with a thickness not significantly smaller than the width

Note 1 to entry: In English, some industries define a large block as a billet.

3.1.2.6 prefabricated ware
pieces cut, abraded or otherwise formed from a board or block of product, e.g. elbows, T-pieces, etc

Note 1 to entry: These several pieces are glued together to the required form.

3.1.2.7 production line
assemblage of equipment that produces products using a continuous process

3.1.2.8 production unit
assemblage of equipment that produces products using a discontinuous process

3.2 Symbols, units and abbreviated terms

3.2.1 Symbols and units used in this standard

\( a_p \) is the practical sound absorption coefficient

\( a_w \) is the weighted sound absorption coefficient

\( b \) is the width
\( D_i \) is the inside diameter \( \text{mm} \)

\( D_o \) is the outside diameter \( \text{mm} \)

\( d \) is the thickness \( \text{mm} \)

\( d_p \) is the declared thickness of the product \( \text{mm} \)

\( \Delta e_b \) is the relative change in width \( \% \)

\( \Delta e_d \) is the relative change in thickness \( \% \)

\( \Delta e_l \) is the relative change in length \( \% \)

\( L \) is the deviation from linearity \( \text{mm} \)

\( l \) is the length \( \text{mm} \)

\( \lambda \) is the thermal conductivity \( \text{W/(m·K)} \)

\( \lambda_p \) is the declared thermal conductivity \( \text{W/(m·K)} \)

\( \mu \) is the water vapour diffusion resistance factor —

\( P_d \) is the deformation under a point load of 1 000 N \( \text{mm} \)

\( S_b \) is the deviation from squareness on length and width \( \text{mm/m} \)

\( S_d \) is the deviation from squareness on thickness \( \text{mm} \)

\( s_d \) is the water vapour diffusion equivalent on air layer thickness \( \text{m} \)

\( S_{\text{max}} \) is the deviation from flatness \( \text{mm} \)

\( \sigma_m \) is the compressive strength \( \text{kPa} \)

\( \sigma_b \) is the bending strength \( \text{kPa} \)

\( \sigma_{\text{mt}} \) is the tensile strength perpendicular to faces \( \text{kPa} \)

\( \sigma_t \) is the tensile strength parallel to faces \( \text{kPa} \)

\( v \) is the deviation from squareness for pipe sections \( \text{mm} \)

\( W_{lp} \) is the long term water absorption by partial immersion \( \text{kg/m}^2 \)

\( W_p \) is the short-term water absorption \( \text{kg/m}^2 \)

\( X_{\text{ct}} \) is the compressive creep \( \text{mm} \)

\( X_t \) is the deformation at time \( t \) \( \text{mm} \)

\( Z \) is the water vapour resistance \( \text{m}^2 \text{h Pa/mg} \)

\( AP \) 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

\( BS \) is the symbol of the declared level for bending strength

\( CC(i_1/i_2/y) \sigma_c \) is the symbol of the declared level for compressive creep

\( CL \) is the symbol of the declared level for soluble chlorides

\( CS(Y) \) is the symbol of the declared level for compressive strength

\( F \) is the symbol of the declared level of soluble fluoride ions
L is the symbol of the declared level for linearity
MU is the symbol of the declared value for water vapour diffusion resistance factor
NA is the symbol of the declared level of soluble sodium ions
pH is the symbol of the declared level of the pH-value
PL(P) is the symbol of the declared level for penetration under point load
SI is the symbol of the declared level of soluble silicate ions
ST(+) is the symbol of the declared level for maximum service temperature
ST(–) is the symbol of the declared level for minimum service temperature
TP is the symbol of the declared level for tensile strength parallel to faces
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
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

3.2.2 Abbreviated terms used in this standard

AVCP is Assessment and Verification of Constancy of Performance (previously named attestation of conformity)
CG is Cellular Glass
DoP is Declaration of Performance
FPC is Factory Production Control
PTD Product Type Determination (previously named ITT for Initial Type Test)
RtF Reaction to Fire
ThIBEII is Thermal Insulation for Building Equipment and Industrial Installations
VCP is Verification of Constancy of Performance (previously named evaluation of conformity)

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 6.

4.2 For all applications

4.2.1 Thermal conductivity

For flat specimens, thermal conductivity shall be based upon measurements carried out in accordance with EN 12667 or EN 12939 for thick products. For cylindrical specimens EN ISO 8497 shall be used as specified in 5.3.2.