SLOVENSKI STANDARD
oSIST prEN 16977:2016

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Toplotnoizolacijski proizvodi za stavbe - Industrijsko izdelani proizvodi iz kalcijevih silikatov (CS) - Specifikacija

Thermal insulation products for buildings - Factory made calcium silicate (CS) products - Specification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte Produkte aus Calciumsilicat (CS) - Spezifikation

Produits isolants thermiques pour le bâtiment - Produits manufacturés en silicate de calcium (CS) - Spécification

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

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Thermal insulation products for buildings - Factory made calcium silicate (CS) products - Specification

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

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European foreword

This document (prEN 16977:2016) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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 Regulation No 305/2011.

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

1 Scope

This draft European Standard specifies the requirements for factory made calcium silicate products with or without lamination or coating which are used for the thermal insulation of buildings.

Calcium silicate products have also the capability to regulate air moisture in building rooms, which means to absorb moisture from the air and opposite to give the moisture back to the room due to the capillarity of the product.

Calcium silicate insulation material comprising hydrated calcium silicate, normally reinforced by incorporated fibres. The main crystal phases are Xonotlite, Tobermorite with or without Wollastonite.

The products are manufactured in the form of boards, segments and prefabricated ware.

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

This draft European Standard does not specify the required level or class of a given property that shall 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.

This draft European Standard is not valid for products with declared thermal resistance lower than 0,13 m^2 K/W or a declared thermal conductivity greater than 0,075 W/(mK) at 10 °C.

This draft European Standard does not cover aerated concrete, autoclaved aerated concrete, mineral foam insulating products and sand-lime bricks as well as *in situ* insulation products and products intended to be used for the insulation of the building equipment and industrial installations.

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

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

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 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 ISO 354, *Acoustics — Measurement of sound absorption in a reverberation room (ISO 354)*

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

EN ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value) (ISO 1716)*

EN ISO 9229:2007, *Thermal insulation — Vocabulary (ISO 9229:2007)*

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

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

EN ISO 15148, *Hygrothermal performance of building materials and products — Determination of water absorption coefficient by partial immersion (ISO 15148)*

ISO 16269-6:2005, *Statistical interpretation of data — Part 6: Determination of statistical tolerance intervals*

3 Terms, definitions, symbols, units and abbreviated terms

3.1 Terms and definitions

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

3.1.1
calcium silicate
insulation material comprising hydrated calcium silicate, normally reinforced by incorporating fibres

3.1.2
level
value which is the upper or lower limit of a requirement and given by the declared value of the characteristic concerned

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

3.1.4
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 1 to entry: Boards are usually thinner than slabs. Boards and slabs can also be supplied in tapered form.

3.1.5
segment
rigid or semi-rigid insulation product for application to large diameter cylindrical or spherical equipment

3.1.6
facing
functional or decorative surface layer with a thickness of less than 3 mm, e.g. paper, plastic film, fabric or metal foil, which is not considered as separate thermal insulation layer to be added to the thermal resistance of the product

3.1.7
coating
functional or decorative surface layer with a thickness of less than 3 mm usually applied by painting, spraying, pouring or trowelling, which is not considered as separate thermal insulation layer to be added to the thermal resistance of the product

3.1.8
composite insulation product
product which can be faced or coated made from two or more layers bonded together by chemical or physical adhesion consisting of at least one factory made thermal insulation material layer

3.1.9
multi-layered insulation product
product which can be faced or coated made from two or more layers of a thermal insulation material from the same European Standard, which are bonded together horizontally by chemical or physical adhesion

3.1.10
production lot
definite quantity produced per maximum 24 h of some commodity manufactured or produced under conditions which are presumed uniform

3.1.11
production line
assemblage of equipment that produces products using a continuous process

3.1.12
production unit
assemblage of equipment that produces products using a discontinuous process

Note 1 to entry: For PTD and FPC, units using the same process in one factory.

3.2 Symbols, units and abbreviated terms

For the purposes of this document, the following symbols and units apply.

α	is the coefficient describing the influence of moisture on the thermal conductivity	–
α_p	is the practical sound absorption coefficient	–
α_w	is the weighted sound absorption coefficient	–
b	is the width	mm
d	is the thickness	mm
d_N	is the nominal thickness of the product	mm
l	is the length	mm
$\Delta\varepsilon_b$	is the relative change in width	%
$\Delta\varepsilon_d$	is the relative change in thickness	%
$\Delta\varepsilon_l$	is the relative change in length	%
k	is a factor related to the number of test results available	–
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_{mean}	is the mean thermal conductivity	W/(m·K)
$\lambda_{10,dry}$	is the thermal conductivity in the dry state	W/(m·K)
λ_U	is the design thermal conductivity	W/(m·K)
$m_{23,dry}$	is the mass of specimen in the dry state at 23 °C	kg
$m_{23,50}$	is the mass of specimen at 23 °C and 50 % relative humidity	kg
μ	is the water vapour diffusion resistance factor	–
R_D	is the declared thermal resistance	m^2·K/W
$R_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the thermal resistance	m^2·K/W
R_U	is the design thermal resistance	m^2·K/W
S_b	is the deviation from squareness on length and width	mm/m
S_d	is the deviation from squareness on thickness	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)

σ_b	is the bending strength	kPa
σ_m	is the compressive strength	kPa
σ_{10}	is the compressive stress at 10 % deformation	kPa
$u_{23,50}$	is the moisture content by mass at 23 °C and 50 % relative humidity	kg/kg
W_p	is the short-term water absorption by partial immersion	kg/m^2
Z	is the water vapour resistance	$m^2 \cdot h \cdot Pa/mg$
W_w	is the water absorption coefficient	$kg/(m^2\ h^{0,5})$
CS(10\Y)	is the symbol of the declared level for compressive stress or compressive strength	
DS(70,-)	is the symbol of the declared value for dimensional stability under specified temperature conditions	
DS(23,90) or DS(70,90)	is the symbol of the declared value for dimensional stability under specified temperature and relative humidity conditions	
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	
MU	is the symbol of the declared value for water vapour diffusion resistance factor	
WA	is the symbol of the declared value of water absorption coefficient	

Abbreviated terms used in this standard:

AVCP is	**A**ssessment and **V**erification of **C**onstancy of **P**erformance
CS is	**C**alcium **S**ilicate
DoP is	**D**eclaration **o**f **P**erformance
FPC is	**F**actory **P**roduction **C**ontrol
NPD is	**N**o **P**erformance **D**eclared
PTD is	**P**roduct **T**ype **D**etermination
RtF is	**R**eaction **t**o **F**ire
ThIB is	**Th**ermal **I**nsulation for **B**uildings

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.

For multi-layered insulation products additional requirements are given in Annex C.

One test result for a product property is the average of the measured values on the numbers of test specimens given in Table 5.

NOTE Information on additional properties is given in Annex D.