



# SLOVENSKI STANDARD

## oSIST prEN 16491:2018

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### Toplotnoizolacijski proizvodi za stavbe - Industrijsko izdelani sestavljeni izdelki - Specifikacija

Thermal insulation products for buildings - Factory made composite products -  
Specification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte Mehrschicht-Produkte -  
Spezifikation

Produits isolants thermiques pour le bâtiment - Produits composites manufacturés -  
Spécification

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#### **ICS:**

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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English Version

## Thermal insulation products for buildings - Factory made composite products - Specification

Produits isolants thermiques pour le bâtiment -  
Produits composites manufacturés - Spécification

Wärmedämmstoffe für Gebäude - Werkmäßig  
hergestellte Mehrschicht-Produkte - Spezifikation

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 88.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## prEN 16491:2018 (E)

### European foreword

This European standard (prEN 16491:2018) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This standard is currently submitted to the CEN Enquiry.

This standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential characteristics of EU Regulations.

For relationship with EU Regulations, see informative Annex ZA, which is an integral part of this standard.

The reduction in energy used and emissions produced during the installed life of insulation products exceeds by far the energy used and emissions made during the production and disposal processes.

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## 1 Scope

This document specifies the requirements for factory made composite products to be used for thermal insulation of buildings, such as

- composite insulation products with at least two different thermal insulation layers with or without facings or coatings, covered by a harmonized European Standard from T C88

Products defined by standards EN 13162 to EN 13171 and prEN 16069:2016 will be used for the thermal insulation layers.

This standard does not cover the performance of prefabricated systems incorporating these composite products.

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

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.

Self-supporting building products and products for structural use are not covered by this standard.

This standard does not cover *in situ* composite insulation products, composite products for civil engineering applications and composite products intended to be used for thermal insulation of building equipment and industrial installations.

Multi-layered products made from two or more layers of a thermal insulation material from the same standard are covered by the corresponding standards EN 13162 to EN 13172 and prEN 16069:2016.

## 2 Normative references

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The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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, *Thermal insulating products for building applications - Determination of compression behaviour*

EN 1603, *Thermal insulating products for building applications - Determination of dimensional stability under constant normal laboratory conditions (23 °C/ 50 % relative humidity)*

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

EN 1605, *Thermal insulating products for building applications - Determination of deformation under specified compressive load and temperature 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*

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

EN 12086, *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 12090, *Thermal insulating products for building applications - Determination of shear behaviour*

EN 12091, *Thermal insulating products for building applications - Determination of freeze-thaw resistance*

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

EN 12431, *Thermal insulating products for building applications - Determination of thickness for floating floor insulating products*

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*

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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 (PU) 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 expanded perlite board (EPB) products — 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*

EN 13172, *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 test*

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, *Thermal insulation products - Instructions for mounting and fixing for reaction to fire testing - Factory made products*

prEN 16069:2016, *Thermal insulation products for buildings — Factory made products of polyethylene foam (PEF) — Specification*

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

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, *Thermal insulation - Vocabulary (ISO 9229)*

EN ISO 10456:2007, *Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values (ISO 10456)*

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)*

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## prEN 16491:2018 (E)

### 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 and the following apply:

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

##### 3.1.1

##### **composite insulation product**

composite insulation product

##### 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 shall fall

##### 3.1.4

##### **facing**

functional or decorative surface material with a thickness of less than 3 mm, e.g. made from paper, plastics, wood or metal, which is not considered as separate thermal insulation layer to be added to the thermal resistance of the product

##### 3.1.5

##### **coating**

functional or decorative surface layers 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

#### 3.2 Symbols, units and abbreviated terms

##### 3.2.1 Symbols and units used in this standard

$a_l$	is the alignment	mm/m
$\alpha_p$	is the practical sound absorption coefficient	–
$\alpha_w$	is the weighted sound absorption coefficient	–
$b$	is the width	mm
$\Delta b$	is the deviation from the nominal width	%
$c$	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
$d_S$	is the thickness of the test specimen	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	%
$\varepsilon_{ct}$	is the compressive creep	%
$\varepsilon_t$	is the total thickness reduction	%
$F_p$	is the point load at a given deformation	N
$k$	is a factor related to the number of test results	–
$k_a$	is a factor related to the number of aged test results	–
$k_i$	is a factor related to the number of initial test results	–
$l$	is the length	mm
$\Delta l$	is the deviation from the nominal length	%
$m_1$	is the mass of the test specimen after 2 h total immersion in water	kg
$m_{23,dry}$	is the mass of specimen in the dry state	kg
$m_{23,50}$	is the mass of specimen at 23 °C and 50 % relative humidity	kg
$\mu$	is the water vapour diffusion resistance factor	–
$n$	is the number of test results	–
$o$	is the offset between single layers	mm
$\Delta o_i$	is the deviation from the nominal offset	mm
$R_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the thermal resistance	$m^2 \cdot K/W$
$R_D$	is the declared thermal resistance	$m^2 \cdot K/W$
$R_i$	is one test result of thermal resistance	$m^2 \cdot K/W$
$R_{mean}$	is the mean thermal resistance	$m^2 \cdot K/W$
$R_U$	is the design thermal resistance	$m^2 \cdot K/W$
$s'$	is the dynamic stiffness	$MN/m^3$
$S_b$	is the deviation from squareness on length and width	mm/m
$S_{max}$	is the deviation from flatness	mm/m
$s_R$	is the estimate of the standard deviation of the thermal resistance	$m^2 \cdot K/W$
$\sigma_b$	is the declared bending strength	kPa
$\sigma_{bc}$	is the bending strength at a constant span	kPa
$\sigma_c$	is the declared compressive stress	kPa
$\sigma_{10}$	is the compressive stress at 10 % deformation	kPa
$\sigma_m$	is the compressive strength	kPa
$\sigma_{mt}$	is the tensile strength perpendicular to faces	kPa
$\tau$	is the declared shear strength	kPa
$u_{23,50}$	is the moisture content by mass at 23 °C and 50 % relative humidity	kg/kg

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$W_{ip}$	is the long-term water absorption by partial immersion	kg/m <sup>2</sup>
$W_{it}$	is the long-term water absorption by total immersion	% vol.
$W_{sp}$	is the short-term water absorption by partial immersion	kg/m <sup>2</sup>
$W_{dv}$	is the long-term water absorption by diffusion	% vol.
$X_0$	is the initial deformation after 60 s from the beginning of loading	mm
$X_{ct}$	is the compressive creep	mm
$X_t$	is the deformation at time $t$ (total thickness reduction)	mm
$Z$	is the water vapour resistance	m <sup>2</sup> ·h·Pa/mg

AD(A)	is the symbol of the declared apparent overall density
AF <sub>r</sub>	is the symbol of the declared level of airflow resistivity
AD(C)	is the symbol of the declared apparent core density
AP	is the symbol of the declared value of practical sound absorption coefficient
AW	is the symbol of the declared value of weighted sound absorption coefficient
BS	is the symbol of the declared bending strength
BS(z)	is the symbol of the declared level of bending strength at a constant span
CC(i1/i2/y)σ <sub>c</sub>	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 strength
DLT(i)5	is the symbol of the declared level for deformation under load and temperature at conditions set with a maximum of 5 % deformation
DS(70,-) or DS(-20,-)	is the symbol of the declared level for dimensional stability under specified temperature
DS(23,50) or DS(23,90) or DS(70,90)	is the symbol of the declared level for dimensional stability under specified temperature and humidity
PL(2) or PL(5)	is the symbol of the declared level of point load for 2 or 5 mm deformation
O	is the symbol of the declared value for offset tolerance
FTCD	is the symbol of the declared value for the freeze–thaw resistance by diffusion
FTCI	is the symbol of the declared value for the freeze–thaw resistance by immersion
SS.	is the symbol of the declared value for the shear strength
T(-i <sub>1</sub> /+ i <sub>2</sub> )	is the symbol of the declared value for thickness tolerance
TC	is the symbol of the declared class for thickness tolerance of compressibility
TR	is the symbol of the declared level for tensile strength perpendicular to faces
WL (T)	is the symbol of the declared value for long term water absorption by total immersion
WS (P)	is the symbol of the declared value for short-term water absorption by partial immersion