



SLOVENSKI STANDARD
oSIST prEN 16491:2012
01-december-2012

**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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Ta slovenski standard je istoveten z: prEN 16491

ICS:

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

DRAFT
prEN 16491

October 2012

ICS 91.100.60

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

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

	Page
Foreword.....	4
1 Scope	5
2 Normative references	5
3 Terms, definitions, symbols, units and abbreviated terms	7
3.1 Terms and definitions	7
3.2 Symbols, units and abbreviated terms.....	8
3.2.1 Symbols and units used in this standard	8
3.2.2 Abbreviated terms used in this standard	11
4 Requirements	12
4.1 General.....	12
4.2 For all applications	12
4.2.1 Thermal resistance	12
4.2.2 Length and width	13
4.2.3 Thickness	13
4.2.4 Squareness.....	13
4.2.5 Flatness	13
4.2.6 Alignment	13
4.2.7 Reaction to fire of the product as placed on the market	14
4.2.8 Durability characteristics.....	14
4.3 For specific applications.....	14
4.3.1 General.....	14
4.3.2 Offset.....	14
4.3.3 Dimensional stability under specified conditions.....	15
4.3.4 Deformation under specified compressive load and temperature conditions.....	15
4.3.5 Tensile strength perpendicular to faces.....	16
4.3.6 Compressive stress or compressive strength	16
4.3.7 Bending strength	16
4.3.8 Shear behaviour.....	16
4.3.9 Point load.....	17
4.3.10 Compressive creep.....	17
4.3.11 Water absorption	17
4.3.12 Water vapour transmission	18
4.3.13 Freeze-thaw resistance	18
4.3.14 Compressibility	18
4.3.15 Dynamic stiffness	20
4.3.16 Sound absorption	20
4.3.17 Air flow resistivity	20
4.3.18 Continuous glowing combustion.....	20
4.3.19 Release of dangerous substances.....	20
5 Test Methods.....	20
5.1 Sampling.....	20
5.2 Conditioning.....	20
5.3 Testing	21
5.3.1 General.....	21
5.3.2 Thermal resistance	21
6 Designation code	23
7 Evaluation of conformity.....	24
7.1 General.....	24
7.2 Initial type testing	24
7.3 Factory production control.....	24

8	Marking and labelling	25
Annex A	(normative) Determination of the declared value of thermal resistance	26
A.1	General	26
A.2	Input data	26
A.3	Declared value	26
A.3.1	General	26
A.3.2	Declaration of thermal resistance	26
Annex B	(normative) Initial type testing (ITT) and factory production control (FPC)	28
Annex ZA	(informative) Relationship between this European Standard and the Essential Requirements of EU Directive 89/106/EEC	32
ZA.1	Scope and relevant characteristics	32
ZA.2	Procedures for attestation of conformity of factory made composite products	34
ZA.2.1	Systems of attestation of conformity	34
ZA.2.2	EC certificate and declaration of conformity	36
ZA.3	CE Marking and labelling	38

Tables

Table 1	— Test conditions for dimensional stability under specified temperature and humidity conditions	15
Table 2	— Levels for deformation under specified compressive load and temperature conditions	16
Table 3	— Classes for thickness tolerances	19
Table 4	— Levels for compressibility	19
Table 5	— Test methods, test specimens and conditions	22
Table A.1	— Values for k for one sided 90 % tolerance interval with a confidence level of 90 %	27
Table B.1	— Minimum number of tests for ITT and minimum product testing frequencies	28
Table B.2	— Minimum product testing frequencies for the reaction to fire characteristics	30
Table ZA.1	— Relevant clauses for composite products and intended use	33
Table ZA.2	— Systems of attestation of conformity	34
Table ZA.3.1	— Assignment of evaluation of conformity tasks for products under system 1	35
Table ZA.3.2	— Assignment of evaluation of conformity tasks for products under system 3 or system 3 combined with system 4 for reaction to fire	36

Figures

Figure 1	— Measurement of deviation from alignment	13
Figure 2	— Offset of composite layers	15
Figure ZA.1	— Example 1 for CE marking information	39
Figure ZA.2	— Example 2 for CE marking information	40
Figure ZA.3	— Example 3 for CE marking information	41
Figure ZA.4	— Example 4 for CE marking information	42

Foreword

This document (prEN 16491:2012) 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 Directive.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This standard contains three Annexes:

Annex A (normative), Determination of the declared values of thermal resistance

Annex B (normative), Initial type testing (ITT) and Factory production control (FPC)

Annex ZA (informative), Clauses of this European standard addressing the provisions of the EU Construction Products Directive

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 European standard 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 and with or without facings or coatings, and composite products with thermal insulation layer/s bonded to additional external layer/s of non-insulation products.

Products defined by standards EN 13162 to 13171 and prEN 16069 shall be used for the thermal insulation layers. If a product other than those defined in above standards is used as one of the thermal insulation layers, then its properties declared for the composite shall be assessed according to test methods and principles in above mentioned standards.

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.

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2 Normative references

oSIST prEN 16491:2012

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, *Thermal insulating products for building applications — Determination of compression behaviour*

EN 1602, *Thermal insulating products for building applications — Determination of apparent density*

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*

prEN 16491:2012 (E)

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

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*

oSIST prEN 16491:2012

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 (PUR) 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 insulating products — Evaluation of conformity*
- EN 13501-1:2007+A1:2009, *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*
- FprEN 16069, *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 building products — Non-combustibility test (ISO 1182)*
- EN ISO 1716, *Reaction to fire tests for building products — Determination of the heat of combustion (ISO 1716)*
- EN ISO 4590, *Rigid cellular plastics — Determination of the volume percentage of open cells and closed cells (ISO 4590)*
- EN ISO 9229, *Thermal insulation — Vocabulary (ISO 9229)*
- EN ISO 10456, *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 building products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*
- ISO 16269-6, *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 standard, the definitions given in EN ISO 9229 apply with exception or in addition of the following:

prEN 16491:2012 (E)**3.1.1
composite products****3.1.1.1
thermal insulation composite board, panel or slab**

factory made product, which can be faced or coated, made from two or more layers of different thermal insulation products. The different insulation layers can be mono- or multi-layered and are bonded together by chemical or physical adhesion

**3.1.1.2
composite board, panel or slab with thermal insulation**

factory made product with a thermal insulation core, which can be mono- or multi-layered or a composite with different insulation layers and which is covered by external layers of thickness > 3 mm (covering) on one or both sides made from wood and other organic materials or mineral materials (e.g. glass, gypsum, mortar, silicate). All layers are bonded together by chemical or physical adhesion

**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 or equal to 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

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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
α_p	is the practical sound absorption coefficient	—
α_w	is the weighted sound absorption coefficient	—
b	is the width	mm
Δb	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	%
ε_{ct}	is the compressive creep	%
ε_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
Δl	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
μ	is the water vapour diffusion resistance factor	—
n	is the number of test results	—
o	is the offset between single layers	mm
Δo_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 ·K/W
R_D	is the declared thermal resistance	m ² ·K/W
R_i	is one test result of thermal resistance	m ² ·K/W
R_{mean}	is the mean thermal resistance	m ² ·K/W
R_U	is the design thermal resistance	m ² ·K/W

prEN 16491:2012 (E)

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 ·K/W
σ_b	is the declared bending strength	kPa
σ_{bc}	is the bending strength at a constant span	kPa
σ_c	is the declared compressive stress	kPa
σ_{10}	is the compressive stress at 10 % deformation	kPa
σ_m	is the compressive strength	kPa
σ_{mt}	is the tensile strength perpendicular to faces	kPa
τ	is the declared shear strength	kPa
$u_{23,50}$	is the moisture content by mass at 23 °C and 50 % relative humidity	kg/kg
W_{lp}	is the long-term water absorption by partial immersion	kg/m ²
W_{lt}	is the long-term water absorption by total immersion	% vol.
W_{sp}	is the short-term water absorption by partial immersion	kg/m ²
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 ² ·h·Pa/mg

AD(A)	is the symbol of the declared apparent overall density
AF _r	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($i_1/i_2/y$) σ_c	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 mm 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_1 / $+i_2$)	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
WS(T)	is the symbol of the declared value of short term water absorption by total immersion
WD(V)	is the symbol of the declared value of long term water absorption by diffusion
Z	is the symbol of the declared value for water vapour resistance

3.2.2 Abbreviated terms used in this standard

C/n	is C omposite with n for number of different layers
ITT	is I nitial T ype T est
FPC	is F actory P roduction C ontrol
RtF	is R eaction to F ire