



SLOVENSKI STANDARD
oSIST prEN 16863:2015
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**Toplotnoizolacijski proizvodi za stavbe - Odsevni izolacijski proizvodi (RI) -
Specifikacija**

Thermal insulation products for buildings - Factory made reflective insulation products
(RI) - Specification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte reflektierende
Wärmedämmstoffe - Spezifikation

Produits isolants thermiques pour le bâtiment - Produits d'isolation réfléchissants
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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Thermal insulation products for buildings - Factory made reflective insulation products (RI) - Specification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte
reflektierende Wärmedämmstoffe - 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.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (prEN 16863:2015) 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(s).

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

This European Standard is one of a series of standards for thermal insulation products used in buildings but this European Standard may be used in other areas where appropriate.

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 reflective insulation products, which are used for the thermal insulation of buildings. The products are manufactured in the form of rolls, boards or sheets and are used in conjunction with an air space or spaces and in non-load-bearing applications.

It applies to thermal insulation products that derive a proportion of their claimed thermal properties from the presence of one or more reflective or low emissivity surfaces together with any associated airspace(s).

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

This European 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.

This European Standard covers the use of products for heat retention in buildings (cold or temperate climate) and an informative annex provides for the provision of further information on the product performance for applications with downwards heat flow.

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*

<https://standards.iteh.ai/catalog/standards/sist/05471328-9da1-4a4d-a92b->

EN 824, *Thermal insulating products for building applications - Determination of squareness*

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

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 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 12310-1, *Flexible sheets for waterproofing - Part 1: Bitumen sheets for waterproofing - Determination of resistance to tearing (nail shank)*

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*

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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 13859-1:2014, *Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing*

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

EN 16012:2012+A1:2015, *Thermal insulation for buildings - Reflective insulation products - Determination of the declared thermal performance*

EN 29053, *Acoustics - Materials for acoustical applications - Determination of airflow resistance (ISO 9053)*

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 8990, *Thermal insulation - Determination of steady-state thermal transmission properties - Calibrated and guarded hot box (ISO 8990)*

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)*

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 (excepted 2.7.15 and 2.7.16) and the following apply.

3.1.1

reflective insulation product

thermal insulation product that derives a proportion of its claimed thermal properties from the presence of one or more reflective or low emissivity surfaces together with any associated airspace(s)

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

[SOURCE: EN ISO 9229:2007, 2.7.15, modified]

3.1.3**class**

combination of two levels of the same property between which the performance shall fall

[SOURCE: EN ISO 9229:2007, 2.7.16, modified]

3.2 Symbols and units

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

Table 1 — Symbols

Symbol	Designation	Unit
b	width	mm
d	thickness	mm
d_L	thickness under a load of 25 Pa or 250 Pa (see 4.2.4)	mm
d_N	nominal thickness of the product	mm
k	factor related to the number of test results	–
l	length	mm
N	number of test results	–
$R_{(HFD)}$	thermal resistance with heat flow downward	$m^2 \cdot K/W$
$R_{(HFU)}$	thermal resistance with heat flow upwards	$m^2 \cdot K/W$
$R_{(HHF)}$	thermal resistance with horizontal heat flow	$m^2 \cdot K/W$
$R_{(core)}$	thermal resistance of the core	$m^2 \cdot K/W$
$R_{90/90}$	90 % fractile with a confidence level of 90 % for the thermal resistance	$m^2 \cdot K/W$
R_D	declared thermal resistance	$m^2 \cdot K/W$
R_i	one test result of thermal resistance	$m^2 \cdot K/W$
R_{mean}	mean thermal resistance	$m^2 \cdot K/W$
R_U	design thermal resistance	$m^2 \cdot K/W$
s_R	estimate of the standard deviation of the thermal resistance	$m^2 \cdot K/W$

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Symbol	Designation	Unit
S_{λ}	estimate of the standard deviation of the thermal conductivity	W/(m·K)
W_{lp}	long-term water absorption by partial immersion	kg/m ²
W_p	short-term water absorption	kg/m ²
Z	water vapour resistance	m ² ·h·Pa/mg
ε	emissivity of the surface	–
$\varepsilon_{90/90}$	90 % fractile with a confidence level of 90 % for the emissivity	–
μ	water vapour diffusion resistance factor	–
σ_{mt}	tensile strength perpendicular to faces	kPa
AF _r	level airflow resistivity	
AP	declared level of practical sound absorption coefficient	
AW	declared level of weighted sound absorption coefficient	
MU	declared value for water vapour diffusion resistance factor	
T	declared class or level for thickness tolerances	
TR	declared level for tensile strength perpendicular to faces	
WL(P)	declared level for long-term water absorption by partial immersion	
WS	declared level for short-term water absorption	
Z	declared value for water vapour resistance	

3.3 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

AVCP	A ssessment and V erification of C onstancy of P erformance (previously named attestation of conformity)
DoP	D eclaration of P erformance
FPC	F actory P roduction C ontrol
PTD	P roduct T ype D etermination (previously named ITT for Initial Type Test)
RI	R eflective I nsulation
RtF	R eaction to F ire
ThIB	T hermal I nsulation for B uildings
VCP	V erification of C onstancy of P erformance (previously named evaluation of conformity)

4 Requirements

4.1 General

Product properties shall be assessed in accordance with Clause 5. To comply with this European Standard, products shall meet the requirements of 4.2, and the requirements of 4.3 as appropriate.

One test result for a product property is the average of the measured values on the number of test specimens given in Table 4.

4.2 For all applications

4.2.1 Thermal resistance

Thermal resistance shall be based upon measurements carried out and declared in accordance with EN 16012, and at reference conditioning 23 °C/50 % RH, as defined in 5.2.

The thermal resistance shall be declared by the manufacturer according to the following:

- the reference mean temperature shall be 10 °C;
- the measured values shall be expressed with three significant figures;
- the declared thermal resistance, R_D , shall be given as a limit value representing at least 90 % of the production, determined with a confidence level of 90 %;
- the declared thermal resistance, R_D , shall be based upon the nominal thickness, d_N , or the measured thickness d_L whichever is the lesser thickness;
- the statistical value of thermal resistance, $R_{90/90}$, shall be rounded downwards to the nearest 0,05 m²·K/W, and declared as R_D in levels with steps of 0,05 m²·K/W;

Examples of determination of the declared values of thermal resistance, R_D , are given in Annex D.

R_U (design values) may be determined with reference to EN ISO 10456 and/or EN ISO 6946 for air spaces.

4.2.2 Emissivity

The emissivity of the reflective surface or surfaces of the product shall be determined in accordance with the method given in EN 16012:2012+A1:2015, 5.9 and Annex D, after conditioning in accordance with EN 16012:2012+A1:2015, D.5.3.

Measured values shall be declared by the manufacturer according to the following:

- the measured value shall be expressed to 2 significant figures;
- the declared value of emissivity ε_D shall be given as a limit value representing at least 90 % of the production, determined with a confidence level of 90 %;
- the statistical value of emissivity $\varepsilon_{90/90}$ shall be declared for each external face of the product if the two faces differ (including the presence of printing exceeding 5 % of the area on any face), otherwise the declared value may be the mean value for the two faces provided they do not differ by more than 0,01;
- the statistical value of emissivity shall be rounded upwards to the nearest 0,01. Values less than 0,05 shall be declared as 0,05.

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4.2.3 Length and width

Length, l , and width, b , shall be determined in accordance with EN 822. No test result shall deviate from the nominal values by more than the following:

- - 2 % to + 5 % for length,
- $\pm 2,0$ % for width.

4.2.4 Thickness

Thickness, d , shall be determined in accordance with EN 823 except that the load shall be 25 Pa, and for products with a level of compressive stress or compressive strength of 10 kPa or greater (see 4.3.3), the load shall be 250 Pa. No test result shall deviate from the nominal thickness, d_N , by more than the tolerances given in Table 2 for the declared level or class.

Table 2 — Level and classes for thickness tolerances

Level or class	Tolerances	
T1	- 5 % or - 5 mm ^a	+ 20 mm
T2	- 5 % or - 5 mm ^a	+ 15 % or + 15 mm ^b
T3	- 3 % or - 3 mm ^a	+ 10 % or + 10 mm ^b
T4	- 3 % or - 3 mm ^a	+ 5 % or + 5 mm ^b
T5	- 1 % or - 1 mm ^a	+ 3 mm

^a Whichever gives the greatest numerical tolerance.
^b Whichever gives the smallest numerical tolerance.

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This test shall not be performed on product comprising single thin sheets less than 1 mm in thickness that are supplied in the form of “pillows” or “cushions” (See EN 16012:2012+A1:2015, 4.5, Product Type 4).

4.2.5 Squareness

Squareness shall be only be determined for product supplied as boards or sheets less than 5 m in length and shall be in accordance with EN 824. The deviation from squareness on length and width, S_B , of boards and sheets shall not exceed 10 mm/m.

4.2.6 Mass per unit area

The mass per unit area shall be determined in accordance with EN 1602 but the result shall be declared as the mass per square metre of product. No individual result shall vary by more than 10 % of the declared value.

4.2.7 Tensile strength parallel to faces

Tensile strength parallel to faces, σ_t , shall be determined in accordance with EN 1608. For handling purposes, products shall have a tensile strength parallel to faces high enough to support twice the weight of the full-size product.

4.2.8 Water vapour transmission

Water vapour transmission properties shall be determined in accordance with EN 12086 (using ‘wet’ conditions), and declared as the water vapour resistance, Z or the diffusion factor μ . All test results for Z or μ shall be within the declared tolerance of the declared value.