

SLOVENSKI STANDARD
oSIST prEN 15100-1:2005
01-januar-2005

Toplotnoizolacijski proizvodi za stavbe – Na mestu vgradnje pripravljeni sečninsko formaldehidni penasti (UF) proizvodi – 1. del: Specifikacije penastega sistema pred vgradnjo

Thermal insulating products for buildings - In-situ formed urea-formaldehyde foam (UF) products - Part 1: Specification for the foam system before installation

Wärmedämmstoffe für Gebäude - An der Verwendungsstelle hergestellte Wärmedämmung aus Harnstoff-Formaldehydharz-Schaum (UF) - Teil 1: Spezifikation für das Schaumsystem vor dem Einbau

Produits isolants thermiques pour le bâtiment - Isolation formée en place a base de mousse de formaldéhyde (UF) - Partie 1: Spécification du système de mousse avant la mise en place

Ta slovenski standard je istoveten z: prEN 15100-1

ICS:

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

oSIST prEN 15100-1:2005

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 15100-1:2005](#)

<https://standards.iteh.ai/catalog/standards/sist/640d26de-a05f-40ef-9e99-c831fb2b5b01/osist-pren-15100-1-2005>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 15100-1

November 2004

ICS

English version

Thermal insulating products for buildings - In-situ formed urea-formaldehyde foam (UF) products - Part 1: Specification for the foam system before installation

Produits isolants thermiques pour le bâtiment - Isolation formée en place à base de mousse de formaldéhyde (UF) - Partie 1: Spécification du système de mousse avant la mise en place

Wärmedämmstoffe für Gebäude - An der Anwendungsstelle hergestellte Wärmedämmung aus Harnstoff-Formaldehydharz-Schaum (UF) - Teil 1: Spezifikation für das Schaumsystem vor dem Einbau

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword	3
1 Scope.....	4
2 Normative references	4
3 Definitions, symbols and abbreviations	5
4 Requirements	7
5 Test methods, Conditioning and Testing	10
6 Designation code	11
7 Evaluation of conformity	12
8 Marking, labelling and technical information.....	12
Annex A (normative) Determination of declared thermal conductivity and thermal resistance	14
A.1 Introduction	14
A.2 Input data	14
A.3 Declared values	14
Annex B (normativ) Factory production control.....	16
Annex C (normative) Methods for the determination of the aged value of thermal conductivity and thermal resistance.....	18
C.1 General	18
C.2 Sampling and test specimen preparation.....	18
C.3 Determination of the initial value of thermal conductivity.....	18
C.4 Determination of the aged value of thermal conductivity.....	18
C.5 Declaration of the aged thermal values	19
Annex D (normative) Sample preparation method for the specimens for the thermal conductivity test.....	20
D.1 Procedure	20
Annex E (normative) Sample preparation method for the test specimens other than thermal conductivity.....	21
E.1 Principle	21
E.2 Apparatus	21
E.3 Procedure	21
Annex F (normative) Determination of setting time	22
F.1 Principle	22
F.2 Apparatus	22
F.3 Procedure	22
F.4 Expression of results.....	23
Annex G (informative) Example for the determination of the declared values of thermal conductivity and thermal resistance for a product	24
G.1 Case where both thermal conductivity and thermal resistance are declared	24
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.....	26

Foreword

This document (prEN 15100-1:2004) 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 the 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 consists of two parts. The first part, which is the harmonised part satisfying the mandate and the CPD and is the basis for the CE marking, covers the products, which are placed on the market. The second part, which is the non-harmonised part, covers the specification for the installed products.

This European Standard is one of a series for mineral wool, expanded clay, expanded perlite, exfoliated vermiculite, polyurethane/polyisocyanurate, cellulose and urea formaldehyde in-situ formed insulation products used in buildings, but this standard may be used in other areas where appropriate.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 15100-1:2005](https://standards.iteh.ai/catalog/standards/sist/640d26de-a05f-40ef-9e99-c831fb2b5b01/osist-pren-15100-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/640d26de-a05f-40ef-9e99-c831fb2b5b01/osist-pren-15100-1-2005>

prEN 15100-1:2004 (E)**1 Scope**

This document specifies requirements for in-situ formed urea formaldehyde foam (UF) products when installed in external walls, internal walls, partitions, floors and roofs. Products covered by this standard may also be used for acoustic applications.

This document is a specification for the rigid foam dispensing system before installation.

This document describes the product characteristics and includes procedures for testing, marking and labelling and the rules for evaluation of conformity.

This document does not specify the required level of all properties that should be achieved by a product to demonstrate fitness for purpose in a particular application. The required levels are to be found in regulations or non-conflicting standards.

UF products with a declared thermal conductivity at 10 °C (mean temperature) greater than 0,050 W/(mK) are not covered by this document.

This document does not cover factory made products utilising urea formaldehyde foam intended to be used for the insulation of buildings or for the insulation of building equipment and industrial installations.

This document does not specify all the requirements for the raw materials or the performance requirements for loadbearing applications.

iTeh STANDARD PREVIEW

2 Normative references (standards.iteh.ai)

The following referenced documents are indispensable for the application 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. standards.iteh.ai/standards/sist/640d26de-a05f-40ef-9e99-c831fb2b5b01/osist-pren-15100-1-2005

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

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

EN 1609:1997, *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*

EN 12086:2001, *Thermal insulating products for building application — Determination of water vapour transmission properties*

EN 12667:2001, *Thermal performance of building materials and products— Determination of thermal resistance by means of guarded hot plate and heat flow meter method — 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 method — Thick products of high and medium thermal resistance*

EN 13172, *Thermal insulation products — Evaluation of conformity*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from fire 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*

prEN ISO 9229, *Thermal insulation — Definitions of terms*

EN ISO 354:1993/A1:1997, *Acoustics — Measurement of sound absorption in a reverberation room*

EN ISO 717-2, *Acoustics - Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation*

EN ISO 1182, *Reaction to fire tests for building products – Non-combustibility tests*

EN ISO 1716, *Reaction to fire tests for building products – Determination of the heat of combustion*

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

EN ISO 11925-2, *Reaction to fire tests for building products – Part 2: Ignitability when subjected to direct impingement of flame*

prEN 15100-2, *Thermal insulation products for buildings — In-situ formed urea formaldehyde foam (UF) products — Part 2 Specification for the installed product*

ISO 12491, *Statistical methods for quality control of building materials and components*

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of this document the definitions given in prEN ISO 9229 and the following definitions apply.

3.1.1

urea formaldehyde foam (UF)

cellular plastics insulation material with a substantially open cell structure based on an amino resin made by the polycondensation of urea with formaldehyde

3.1.2

urea formaldehyde foam system

the kit of constituent components which when dispensed generates the urea formaldehyde foam (UF)

3.1.3

urea formaldehyde foam (UF) system types

these shall be either Type, 1, Type 2 or Type 3 as detailed in 3.1.4, 3.1.5 and 3.1.6

3.1.4

foam systems - Type 1

the mixture of components C_1 and C_2 foamed by compressed air with setting times exceeding 60s

3.1.5

foam systems - Type 2

the mixture of components C_3 and C_4 foamed by compressed air with setting times up to and including 60s

3.1.6

foam systems - Type 3

the mixture of components C_1 and C_5 foamed by compressed air with setting times exceeding 25s

prEN 15100-1:2004 (E)

- **C₁**. A solution of urea formaldehyde resin in water.
- **C₂**. Surfactant in water.
- **C₃**. A solution of urea formaldehyde resin and surfactant in water.
- **C₄**. An acid hardening solution containing catalysts.
- **C₅**. An acid hardening solution containing catalysts and a surfactant.

3.1.7**level**

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

3.1.8**class**

a combination of two levels of the same property between which the performance shall fall, where the level is given by the declared value of the characteristic concerned

3.2 Symbols and abbreviations**3.2.1 Symbols used in this document:**

α_p	is the practical sound absorption coefficient	-
α_w	is the weighted sound absorption coefficient	-
d_N	is the nominal thickness of the product	mm
k	is a factor related to the number of test results available	
$\lambda_{90/90}$	is the 90 % fractile with a confidence level of 90% for the thermal conductivity	W/(m·K)
λ_a	is the aged thermal conductivity	W/(m·K)
λ_D	is the declared thermal conductivity	W/(m·K)
λ_h	is the thermal conductivity after the heating treatment	W/(m·K)
λ_i	is the initial thermal conductivity	W/(m·K)
n	is the number of test results	-
$R_{90/90}$	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
T_I	is the initial thickness of the test specimens used for the determined thermal conductivity	mm
T_h	is the thickness of the test specimens used for determining the aged thermal conductivity after the heat treatment	mm
W_p	is the short term water absorption by partial immersion	kg/m ²
Z	is the water vapour resistance	m ² ·h·Pa/mg
AP	is the symbol for the declared level of practical sound absorption coefficient	
AW	is the symbol for the declared level of weighted sound absorption coefficient	
CS(10\Y)	is the symbol for the declared value for compressive stress or strength	
DS (TH)	is the symbol for the declared level for dimensional stability under specified temperature and humidity	
DY	is the symbol for the declared levels of density	
ES	is the symbol for the declaration of the rate of release of formaldehyde	
S	is the symbol for the declared setting time	
MU	is the symbol for the water vapour resistance	
W	is the symbol for the declared short term water absorption by partial immersion	

3.2.2 Abbreviations used in this standard:

UF is Urea Formaldehyde foam

ITT is Initial Type Test

4 Requirements

4.1 General

The foam properties shall be assessed in accordance with clause 5. To conform with this document dispensed foam systems shall provide urea formaldehyde foams meeting the requirements of 4.2 and 4.3 as appropriate.

One test result for a foam 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 and thermal conductivity

Thermal resistance and thermal conductivity shall be based upon measurements carried out in accordance with EN 12667 or EN 12939 for thick products.

The thermal resistance and thermal conductivity shall be determined in accordance with Annex A and Annex C and 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 thermal conductivity, λ_D , shall always be declared. The thermal resistance, R_D , shall be declared wherever this is possible;
- the declared thermal resistance, R_D , and the thermal conductivity, λ_D , shall be given as limit values representing at least 90 % of the production, determined with a confidence level of 90 %;
- the value of thermal conductivity, $\lambda_{90/90}$, shall be rounded upwards to the nearest 0,001 W/(m·K) and declared as λ_D in levels with steps of 0,001 W/(m·K);
- the declared thermal resistance, R_D , shall be calculated from the thickness, and the corresponding thermal conductivity, $\lambda_{90/90}$ unless measured directly;
- the value of thermal resistance, $R_{90/90}$, when calculated from the thickness, and the corresponding thermal conductivity, $\lambda_{90/90}$; 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.

An example of the determination of the declared values of thermal conductivity and thermal resistance is given in Annex G.

NOTE The declaration of the installed declared thermal resistance for an installed urea formaldehyde foam is made in Part 2 of this document.

prEN 15100-1:2004 (E)**4.2.2 Reaction to fire**

Reaction to fire classification (Euroclasses) shall be determined in accordance with EN 13501-1.

4.2.3 Nominal density

The producer shall classify in Table 1 the nominal density measured according to EN 1602.

Table 1 — Classes of density

Classes	Range of classes (kg/m ³)
DY6	≥ 6 to < 14
DY14	≥ 14

4.2.4 Setting time

This setting time, S, shall be declared having been determined by the method given in Annex F. If the foam is a Type 2 then the setting value shall be less than or equal to 60 s. If it is a Type 1 system then the setting time shall be greater than 60 s. If it is a Type 3 system then the setting time shall be greater than 25s.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4.2.5 Durability characteristics**4.2.5.1 General**

The appropriate durability characteristics have been considered and are covered in 4.2.5.2 and 4.2.5.3.

oSIST prEN 15100-1:2005

<http://standards.iteh.ai/catalog/standards/sist/6461061a-05f0-40e0-bc831fb2b5b01/osist-pren-15100-1-2005>

4.2.5.2 Durability of reaction to fire against ageing/degradation

There is no change in reaction to fire for UF products with time.

4.2.5.3 Durability of thermal resistance against ageing/degradation

The thermal conductivity (4.2.1) of the basic UF products does not change with time. However, account is taken of any shrinkage which may occur with time in stating the declared thermal resistance values.

4.3 Specific applications**4.3.1 General**

If a property, described in 4.3, is not declared by the manufacturer then the property need not be determined.

4.3.2 Sound absorption

Sound absorption coefficient shall be determined in accordance with EN ISO 354:1993/A1:1997. The sound absorption characteristics shall be calculated according to EN ISO 11654 with the values for α_p (practical sound absorption coefficient) at frequencies: 125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz and the single number value for α_w (weighted sound absorption coefficient).

α_p and α_w shall be rounded to the nearest 0,05 (α_p larger than 1 shall be expressed as $\alpha_p = 1$) and declared in levels with steps of 0,05. No test result (α_p and α_w) shall be lower than the declared level.

4.3.3 Release of dangerous substances

The rate of release shall be measured and assessed according to EN ISO 717-2 using an internal facing with a specified water vapour diffusion resistance. The temperature of the sample shall be 40 °C when measuring.

NOTE The indoor rate of emission of formaldehyde is related to the ability of water vapour diffusion resistance d_R of the inner cladding, temperature, rate of air changes and relative humidity. If an indoor value of formaldehyde shall be less or equal than 0,1 mg/dm³ measured at a room temperature of (23 ± 3) °C and relative humidity of (50 ± 5) %, the rate of release of formaldehyde can be influenced by the d_R value of the wall. The relationship between the rate of release of formaldehyde and the d_R value is shown in Table 2.

Table 2 — Rate of release of formaldehyde depending on the conditions of the inner cladding

Classes	Value of $d_R = \mu/d$ (m)	Rate of release of formaldehyde in mg/dm ³ (air change once per h)
ES1	< 0.5	≤ 1,5
ES2	> 0,5 to ≤1	> 1,5 to ≤ 3,5
ES3	> 1	> 3,5 to ≤ 5

iTeh STANDARD PREVIEW

4.3.4 Short-term water absorption by partial immersion

(standards.iteh.ai)

The short term water absorption by partial immersion, W_p , in kg/m², shall be determined using EN 1609, Method A. No test result shall be higher than the declared value.

<https://standards.iteh.ai/catalog/standards/sist/640d26de-a05f-40ef-9e99-833fb2bca0e1/sist-pr-en-15100-1-2005>

Table 3 — Classes of water absorption

Classes for Type 1	Classes for Type 2	Classes for Type 3	Range of classes (kg/m ²)
W0	W0	W0	No requirements
W15	W15	W15	< 15
W20	W20	W20	≤ 15 to <20
W25	W25	W25	≥ 20

4.3.5 Water vapour transmission

Water vapour transmission properties shall be determined in accordance with EN 12086, Method B (23 °C, 0/85 % R.H.) and declared as the water vapour resistance, Z. No test result shall be lower than the declared value.

Table 4 — Classes of water vapour transmission

Classes for Type 1	Classes for Type 2	Classes for Type 3	Range of classes (m ² ·h·Pa/mg)
MU0	MU0	MU0	No requirements
MU15	MU15	MU15	< 15
MU20	MU20	MU20	≥ 15 to <20
MU25	Mu25	MU25	≥ 20

prEN 15100-1:2004 (E)**4.3.6 Dimensional stability at specified temperatures****4.3.6.1 Dimensional stability at elevated temperatures**

Dimensional stability shall be determined in accordance with EN 1604. UF products shall be tested for 24 h at (70 ± 2) °C. The relative change in length for all dimensions shall not exceed ± 5 %.

4.3.6.2 Dimensional stability at -20 °C

Dimensional stability at -20 °C shall be determined in accordance with EN 1604. UF products shall be tested for 24 h at (-20 ± 2) °C. The relative change in length for all dimensions shall not exceed ± 2 %.

5 Test methods, Conditioning and Testing**5.1 Test methods****5.1.1 Thermal conductivity**

Prepare a test sample in accordance with the method given in Annex D.

5.1.2 Other characteristics

Prepare a test sample in accordance with Annex E.

5.2 Conditioning

The test specimens shall be stored at (23 ± 2) °C and (50 ± 5) % relative humidity for at least 16 hours prior to testing.

5.3 Testing**5.3.1 General**

Table 5 gives the dimensions of the test specimens, the minimum number of test specimens required to get one test result and any specific conditions which are necessary.

5.3.2 Thermal resistance and thermal conductivity

Thermal resistance and thermal conductivity shall be determined in accordance with EN 12667 or EN 12939 for thick products and under the following conditions:

- at a mean reference temperature of $(10 \pm 0,3)$ °C;
- after conditioning in accordance with 5.2;
- taking into account the effect of ageing according to Annex C.

NOTE Thermal resistance and thermal conductivity may also be measured at mean temperatures other than 10 °C, providing that the accuracy of the relationship between temperature and thermal properties is sufficiently well documented.