SLOVENSKI STANDARD
SIST EN 17101:2018

01-oktober-2018

Toplotnoizolacijski proizvodi za stavbe - Metode za identifikacijo in metode preskušanja enokomponentne poliuretanske (PU) lepilne pene za kontaktne fasadne toplotnoizolacijske sisteme (ETICS)

Thermal insulation products for buildings - Methods of identification and test methods for one-component PU adhesive foam for External Thermal Insulation Composite Systems (ETICS)

Wärmedämmstoffe für Gebäude - Methoden der Identifizierung und Testmethoden für Ein-Komponenten-PU-Klebstoffschaum für Wärmedämmverbundsysteme (WDVS)

Produits isolants thermiques pour le bâtiment - Méthodes d'identification et méthodes d'essai des mousses PU adhésives monocomposant pour systèmes d'isolation thermique extérieure par enduit sur isolant (ETICS)

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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 - Methods of identification and test methods for one-component PU adhesive foam for External Thermal Insulation Composite Systems (ETICS)

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Wärmedämmstoffe für Gebäude - Methoden der Identifizierung und Testmethoden für Ein-Komponenten-PU-Klebstoffschaum für Wärmedämmverbundsysteme (WDVS)

This European Standard was approved by CEN on 23 April 2018.

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Contents

Page

European foreword ... 3
Introduction ... 4
1 Scope ... 5
2 Normative references ... 5
3 Terms and definitions ... 5
4 Symbols and units ... 5
5 Test methods ... 6
5.1 General ... 6
5.2 Common rules applicable to all tests ... 7
5.2.1 General ... 7
5.3 Foam density ... 7
5.3.1 Test apparatus and materials ... 7
5.3.2 Test procedure (see Figures 1 to 3) ... 8
5.3.3 Calculation of results ... 9
5.4 Tack free time ... 9
5.4.1 Test apparatus and materials ... 9
5.4.2 Test procedure (see Figures 1 to 3) ... 9
5.4.3 Calculation of results ... 10
5.5 Cutting time ... 10
5.5.1 Test apparatus and materials ... 10
5.5.2 Test procedure ... 11
5.5.3 Calculation of results ... 11
5.6 Post application expansion behaviour ... 12
5.6.1 Test apparatus and materials ... 12
5.6.2 Test procedure ... 13
5.6.3 Calculation of test results ... 13
5.7 Cohesion strength ... 15
5.7.1 Test apparatus and materials ... 15
5.7.2 Test procedure ... 16
5.7.3 Calculation of test results ... 19
5.8 Shear strength ... 20
5.8.1 Test apparatus and materials ... 20
5.8.2 Conditioning ... 20
5.8.3 Preparation of the three test specimen ... 20
5.8.4 Test procedure ... 21
5.8.5 Calculation of test results ... 22
6 Test report ... 23

European foreword

This document (EN 17101:2018) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Introduction

This European Standard covers moisture curing one-component PU foams (1C-PU foams) dispensed from pressurized containers and used as adhesive foam.

1 Scope

This document specifies methods of identification and test methods for the performance evaluation of one-component PU foams used as adhesive foam.

Other foams are not covered by this document.

2 Normative references

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 312, *Particleboards — Specifications*

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

3 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
PU adhesive foam
moisture curing one component polyurethane (PU) foam dispensed from pressurised containers

3.2
foam density
density of the free expanded and cured PU adhesive foam

3.3
tack free time
time period between dispensing and formation of an adhesion-free surface of a PU adhesive foam

3.4
cutting time
time period between dispensing of the PU adhesive foam and when it can be clean cut, without destroying the foam structure

3.5
post application expansion behaviour
increase of the distance between the substrate and the applied insulation board from dispensing of the PU adhesive foam until full curing is achieved

4 Symbols and units

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

b is the width in mm

d is the thickness in mm

ρ_a is the foam density in kg/m^3

m is the mass in g

V_0 is the volume level of water before the specimen immersion in ml

V_1 is the volume level of water and specimen following immersion in ml

t is the time in min

F is the force in N

S is the area in mm^2

τ is the shear strength in kPa

5 Test methods

5.1 General

Measureable attributes of polyurethane adhesive foam are:

— foam density;

— tack-free time;

— cutting time;

— post application expansion behaviour;

— cohesion strength;

— shear strength;

Table 1 provides the clause number for each test method, specimen sizes, conditioning and test conditions and the number of measurements required to evaluate each characteristic.

Table 1 — Test methods, test specimens and conditions

Clause	Dimensions of the test specimen	Minimum number of measurements to obtain one test result	Conditioning and test temperature/ relative humidity
5.3 — Foam density	Diameter strings: (20 to 30) mm Length: 200 mm ± 15 mm	5	(23 ± 2) °C (50 ± 5) % r.h.
5.4 — Tack free time	Diameter (20 to 30) mm	3	
5.5 — Cutting time	Diameter (20 to 25) mm	3	
5.6 — Post application expansion behaviour	(500 ± 2) mm × (500 ± 2) mm Spacers: 8 mm ± 0,5 mm thick	1 (Derived from 6 time interval measurements)	
5.7 — Cohesion strength	(50 ± 1) mm × (50 ± 1) mm Spacers: 8 mm ± 0,5 mm thick	5	
5.8 — Shear strength	(100 ± 1) mm × (100 ± 1) mm Spacers: 8 mm ± 0,5 mm thick	3	

5.2 Common rules applicable to all tests

5.2.1 General

a) Canisters from the same batch shall be used to evaluate all properties, as detailed in 5.3 to 5.8.

b) The application of PU adhesive foams for testing shall be performed using the adapter or the gun as specified by the test sponsor.

c) The test canister(s) shall be conditioned at (23 ± 2) °C, (50 ± 5) % r.h. for at least 24 h prior to the test.

d) Each canister shall be shaken vigorously at least 20 times just before application and the first (50 ± 5) g of PU adhesive foam shall be discarded.

e) The test specimen shall be prepared and conditioned at (23 ± 2) °C, (50 ± 5) % r.h.

f) All tests shall be performed at (23 ± 2) °C, (50 ± 5) % r.h.

5.3 Foam density

5.3.1 Test apparatus and materials

5.3.1.1 Canister(s), with PU adhesive foam for evaluation.

5.3.1.2 Application substrate, e.g. PolyEthylene-foil, paper or cardboard.

5.3.1.3 Sharp and clean cutting knife, e.g. scalpel or craft knife with thin blade.

5.3.1.4 Balance, with an accuracy of 0,1 g.

5.3.1.5 Measuring cylinder graduated in increments no greater than 10 ml.

5.3.1.6 Tap water.

5.3.2 Test procedure (see Figures 1 to 3)

a) Five cylindrically shaped strings of PU adhesive foam, each with a diameter between 20 mm to 30 mm and a length of approximately 200 mm are dispensed onto the application substrate at a rate of 50 mm/s to 100 mm/s. The nozzle should be at a distance of (10 ± 5) mm above the substrate to avoid touching the dispensed foam.

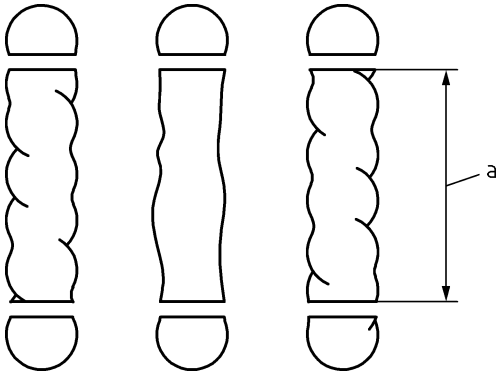
b) After a minimum curing time of 24 h, the strings are trimmed at both ends to an overall length of between 100 mm to 150 mm to form the test specimens.

c) The mass of each test specimen m shall be measured in grams with an accuracy of 0,1 g.

d) The measuring cylinder shall be filled to approximately 50 % of its capacity with tap water and the reference volume V_0 shall be recorded.

e) Each test specimen shall be submerged below the water surface in the measuring cylinder using the blade of the cutting knife. The increased volume V_1 shall be recorded immediately.

Figure 1 — Dispensed strings



Key

a overall length of the trimmed strings between 100 mm and 150 mm (see b))

Figure 2 — Trimmed strings

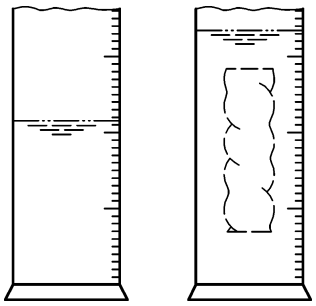


Figure 3 — Measurement

5.3.3 Calculation of results

The density of each of the five test specimens shall be determined using the following formula:

$$\rho_a = \frac{m}{V_1 - V_0} \times 1000 \quad (1)$$

where

ρ_a is the foam density in kg/m3;

m is the mass of the specimen in g;

V_0 is the volume level of water before the specimen immersion in ml;

V_1 is the volume level of water and specimen following immersion in ml.

Each measurement is expressed in kg/m^3 to an accuracy of 0,1 kg/m^3. The test result is the mean value of five measurements.

If any measurement deviates more than ± 5 kg/m^3 from the mean value, the test result shall be discarded.

5.4 Tack free time

5.4.1 Test apparatus and materials

5.4.1.1 Canister, with PU adhesive foam for evaluation.

5.4.1.2 Application substrate, e.g. PolyEthylene-foil, paper or cardboard.

5.4.1.3 Small rod or tube made of PolyEthylene, e.g. a straw.

5.4.1.4 Stopwatch or clock capable of measuring in seconds.

5.4.2 Test procedure

a) One cylindrically shaped string of PU adhesive foam with a diameter of 20 mm to 30 mm is dispensed onto the application substrate at a rate of 50 mm/s to 100 mm/s. The nozzle should be a distance of (10 ± 5) mm above the substrate to avoid touching the dispensed foam. Record the time at which dispensing started (t_0).

b) The surface of the string shall be touched gently with the side of the small PolyEthylene rod/tube without penetrating the skin (see Figure 4).