SLOVENSKI STANDARD
oSIST prEN 15425:2015

01-julij-2015

Lepila - Enokomponentni poliuretan (PUR) za nosilne lesene konstrukcije - Razvrstitev in zahtevane lastnosti

Adhesives - One component polyurethane (PUR) for load-bearing timber structures - Classification and performance requirements

Klebstoffe - Einkomponenten-Klebstoffe auf Polyurethanbasis (PUR) für tragende Holzbauteile - Klassifizierung und Leistungsanforderungen

Adhésifs - Adhésifs polyuréthane monocomposants (PUR) pour structures portantes en bois - Classification et exigences de performance

Ta slovenski standard je istoveten z: **prEN 15425**

ICS:

83.180	Lepila	Adhesives
91.080.20	Lesene konstrukcije	Timber structures

oSIST prEN 15425:2015 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 15425

April 2015

ICS 83.180

Will supersede EN 15425:2008

English Version

Adhesives - One component polyurethane (PUR) for load-bearing timber structures - Classification and performance requirements

Adhésifs - Adhésifs polyuréthane monocomposants (PUR) pour structures portantes en bois - Classification et exigences de performance

Klebstoffe - Einkomponenten polyurethane (PUR) für tragende Holzbauteile - Klassifizierung und Leistungsanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 193.

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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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

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Foreword

This document (prEN 15425:2015) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15425:2008.

Compared to EN 15425:2008, the following changes have been made:

a) terms and definitions have been written in details in Clause 3, not only referring to EN 923:2005+A1:2008;

b) a new classification system has been introduced. 90 °C test temperature and 1 mm glue line thickness are included in the test program in Clause 4;

c) general requirements for the different tests have been listed in 5.1;

d) test treatment A8 (tensile/shear test at 90 °) has been introduced in 5.2, 6.2 and Annex A;

e) a new test method is given in 5.8: Long-term sustained load test at cyclic climate conditions with specimens loaded perpendicular to the glue line (Glasshouse test – prEN 15416-1:2015);

f) the test method EN ISO 2555 has been included in 7.1;

g) the necessary duration times for the test given in 5.7 have been reduced for glue line thickness 0,3 mm (General purpose adhesives). Identical duration times have been introduced for the new class “Special purpose adhesives” with 0,5 mm glue line thickness in test;

h) EN 15416-2:2007, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods – Part 2: Static load test of multiple bondline specimens in compression shear* has been introduced to the EN 302 series as prEN 302-8:2015.

This document is one of a series dealing with one component polyurethane adhesives for use with timber structures, and is published in support of EN 1995-1-1, *Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings.*

The series consists of

— one standard for classification and performance requirements (prEN 15425:2015),

— seven test methods (EN 302-1, EN 302-2, EN 302-3, EN 302-4, prEN 302-8:2015, prEN 15416-1:2015 (“Glass house test”) and prEN 15416-3:2015) used to assess the performance of adhesives after specified heat and humidity treatments, and

— three test methods (EN ISO 2555 (reference in EN 302-7), prEN 15416-4:2015, and prEN 15416-5:2015) to characterize the working properties of the adhesives.

Introduction

Safety statement

Persons using this European Standard should be familiar with the normal laboratory practice, if applicable. This European Standard cannot address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

Environmental statement

It is understood that some of the material permitted in this European Standard may have negative environmental impact. As technological advantages lead to better alternatives for these materials, they will be eliminated from this European Standard to the extent possible.

At the end of the test, it is recommended that the user of this European Standard take care to carry out an appropriate disposal of the wastes, according to local regulation.

1 Scope

This European Standard establishes a classification for one component polyurethane (PUR) adhesives according to their suitability for use in load-bearing timber structures in defined climatic exposure conditions; it specifies performance requirements for such adhesives for the factory manufacture or factory like manufacturing of load-bearing timber structures only.

It also classifies “adhesive lines” where all the products within the line have almost identical physical/chemical properties and gluing performance, but different reactivity.

This European Standard only specifies the performance of adhesives for use in an environment corresponding to the defined conditions.

The performance requirements of this European Standard apply to the adhesives only, not to the timber structure. This European Standard does not cover the performance of adhesives for on-site gluing (except for factory-like conditions) nor the production of wood-based panels, except solid wood panels, or modified and stabilized wood with considerably reduced swelling and shrinkage properties, e.g. such as acetylated wood, heat treated wood and polymer impregnated wood.

This European Standard is primarily intended for the use of adhesive manufacturers and for the use in timber structures bonded with adhesives, to assess or control the quality of adhesives. The requirements apply to the type testing of the adhesives. Production control activities are outside the scope of this European Standard.

Adhesives meeting the requirements of this European Standard are adequate for use in load-bearing timber structure, provided that the bonding process has been carried out according to an appropriate product standard.

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 302-1, *Adhesives for load-bearing timber structures - Test methods - Part 1: Determination of longitudinal tensile shear strength*

EN 302-2, *Adhesives for load-bearing timber structures - Test methods - Part 2: Determination of resistance to delamination*

EN 302-3, *Adhesives for load-bearing timber structures - Test methods - Part 3: Determination of the effect of acid damage to wood fibres by temperature and humidity cycling on the transverse tensile strength*

EN 302-4, *Adhesives for load-bearing timber structures - Test methods - Part 4: Determination of the effects of wood shrinkage on the shear strength*

EN 302-7, *Adhesives for load-bearing timber structures - Test methods - Part 7: Determination of the working life under referenced conditions*

prEN 302-8:2015, *Adhesives for load-bearing timber structures - Test methods - Part 8: Static load test of multiple bond line specimens in compression shear*

EN 923:2005+A1:2008, *Adhesives - Terms and definitions*

EN 14080:2013, *Timber structures - Glued laminated timber and glued solid timber - Requirements*

prEN 15416-1:2015, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 1: Long-term tension load test perpendicular to the bond line at varying climate conditions with specimens perpendicular to the glue line (Glasshouse test)*

prEN 15416-3:2015, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 3: Creep deformation test at cyclic climate conditions with specimens loaded in bending shear*

prEN 15416-4:2015, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 4: Determination of open assembly time under referenced conditions*

prEN 15416-5:2015, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 5: Determination of minimum pressing time under referenced conditions*

EN ISO 2555:1999, *Plastics - Resins in the liquid state or as emulsions or dispersions - Determination of apparent viscosity by the Brookfield Test method (ISO 2555:1989)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923:2005+A1:2008 and the following apply.

3.1
one component polyurethane (PUR) adhesives
urethane polymers, which are cross-linked by reaction with water

3.2
service class 1
climatic conditions characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 65 % for a few weeks per year

Note 1 to entry: In service class 1, which comprises typical indoor conditions, the average moisture content in most soft-woods will not exceed 12 %.

[SOURCE: EN 1995-1-1:2004, 2.3.1.3]

3.3
service class 2
climatic conditions characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 85 % for a few weeks per year

Note 1 to entry: In service class 2, to which most covered exterior conditions belong, the average moisture content in most soft woods will not exceed 20 %.

[SOURCE: EN 1995-1-1:2004, 2.3.1.3]

3.4
service class 3
climatic conditions leading to higher moisture contents than in service class 2

Note 1 to entry: Exterior conditions typically belong to service class 3.

[SOURCE: EN 1995-1-1:2004, 2.3.1.3]

3.5
glue line
adhesive layer between the wood members

3.6
close contact glue line
cc
glue line of thickness maximum 0,1 mm

Note 1 to entry: Close contact glue line is achieved by pressing together two plane wood members with a clamping pressure of (0,8 ± 0,1) N/mm^2 without groves, spacers or similar device.

3.7
thick glue line
glue line of nominal thickness in the range of 0,3 mm to 1,0 mm

Note 1 to entry: Thick glue lines are achieved by using spacers, grooves or similar device with a thickness of 0,3 mm to 1,0 mm when two plain members are glued together.

3.8
adhesive line
series of products, all with almost identical physical/chemical properties and gluing performance, but with different reactivity

4 Classification

Adhesives for structural purpose shall produce joints of such strength and durability that the integrity of the bond is maintained in the assigned service class throughout the expected life of the structure.

PUR-adhesives according to EN 15425 are classified by **Type** (climate condition in use), **Maximum test temperature** and **Maximum glue line thickness in use**. These three subclasses are subdivided as follows.

Type I: To be used in service classes 1, 2 and 3

Type II: To be used in service class 1 only

Maximum test temperature: 50 °C, 70 °C or 90 °C

Maximum glue line thickness in use: 0,1 mm, 0,3 mm and 0,5 mm

Depending on the maximum glue line thickness in use, the adhesives are assigned to different application areas as described below and shown in Table 1.

— **Special purpose adhesives (SP)**: to be used for glue lines between laminations (maximum glue line thickness 0,5 mm) and for finger joints in laminations.

— **General purpose adhesives (GP)**: to be used for glue lines between laminations (maximum glue line thickness 0,3 mm) and for finger joints in laminations.

— **Finger jointing adhesives (FJ)**: to be used for finger jointing of laminations and structural timber only (maximum glue line thickness 0,1 mm).

NOTE Definition of **Special purpose**, **General purpose** and **Type** can be different in other European Standards.

Table 1 — Adhesive classes

Adhesive type designation	Application area	Max. test temperature [a]	Max. glue line thickness		Service classes [b]
			Test	Use	
		°C	mm	mm	
EN 15425 I 70 GP 0,3	**Normal use** General purpose	70	0,5	0,3	1, 2, 3
	Special				
EN 15425 I 90 SP 0,5	Special purpose	90	1,0	0,5	1, 2, 3
EN 15425 I 90 GP 0,3	General purpose	90	0,5	0,3	1, 2, 3
EN 15425 I 90 FJ 0,1	Finger jointing	90	0,3	0,1	1, 2, 3
EN 15425 I 70 SP 0,5	Special purpose	70	1,0	0,5	1, 2, 3
EN 15425 I 70 FJ 0,1	Finger jointing	70	0,3	0,1	1, 2, 3
EN 15425 II 50 SP 0,5	Special purpose	50	1,0	0,5	1
EN 15425 II 50 GP 0,3	General purpose	50	0,5	0,3	1
EN 15425 II 50 FJ 0,1	Finger jointing	50	0,3	0,1	1

a Tested according to prEN 302–8:2015 and Annex A designation A6, A7 or A8.

b The application of the adhesive types in the different service classes can be restricted by national regulations applicable at the end use site of the bonded timber structures.

Table 2 specifies the tests that shall be performed for each application area. References are given to the actual paragraph in this European Standard and to which European Standard the tests are based on.

Table 2 — Necessary tests for adhesives used in different application areas

Application area	Glue line thickness in test	EN 302-1 (based on 6.2) [a]	EN 302-2 (based on 6.3)	EN 302-3 (based on 6.4) [b]	EN 302-4 (based on 6.5)	prEN 302-8:2015 (based on 6.6) [c]	prEN 1541 6-3:2015 (based on 6.7)	prEN 1541 6-1:2015 (based on 6.8)
	mm							
Special Purpose	0,1 [d]	X	X			X		X
	0,5	X		X	X		X	X
	1,0	X						
General purpose	0,1 [d]	X	X			X		X
	0,3						X	
	0,5	X		X	X			X
Finger jointing	0,1 [d]	X	X	X		X	X	X
	0,3	X						

a Climate treatment A1 to A5 and A6 or A7 or A8, depending on maximum test temperature (see Table 1 and Annex A).

b Only for wood surface treated with a primer with pH-value less than 3.

c Maximum test temperature according to Table 1.

d As defined in 3.8, close contact.