



SLOVENSKI STANDARD
oSIST prEN 15425:2022

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**Lepila - Enokomponentni poliuretani (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

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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-Klebstoffe auf Polyurethanbasis (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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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prEN 15425:2021 (E)**European foreword**

This document (prEN 15425:2021) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by UNE.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15425:2017.

Compared to EN 15425:2017, the following main changes have been made:

- a) for adhesive type “Special purpose” the test according to EN 302-8 is performed with a bond line thickness of 0,5 mm;
- b) an additional adhesive subtype I-SP-70-0,5 has been added in Table 1;
- c) for adhesive type FJ the test according to EN 302-2 is required only with short closed assembly time, and the test according to EN 15416-5 is only required with thin glue line;
- d) for finger joint delamination tests on additional wood species the reference to EN 301 has been replaced by a new Annex B;
- e) for the delamination test according to EN 302-2 with preservative treated wood a test with Scots pine (*Pinus sylvestris*) and silver fir (*Abies alba*) covers also Norway spruce (*Picea abies* L.);
- f) description of the test procedure for an “adhesive line” modified;
- g) description of a test procedure when a primer is used in all bonding operations added in Clause 4;
- h) provisions and maximum tolerance for testing and application of a primer added in 5.1;
- i) information on water spraying included in the scope and as a new Annex C.

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 (EN 15425);
- eight test methods (EN 302-1, EN 302-2, EN 302-3, EN 302-4, EN 302-8, EN 15416-1 (“Glass house test”), EN 15416-3 and Annex B of this document) 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), EN 15416-4, and EN 15416-5) to characterize the working properties of the adhesives.

Introduction

Safety statement

Persons using this document should be familiar with the normal laboratory practice, if applicable. This document 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 document 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 document take care to carry out an appropriate disposal of the wastes, according to local regulation.

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prEN 15425:2021 (E)**1 Scope**

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

The performance requirements of this document apply to the adhesives only, not to the manufactured timber products. This document 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 document is primarily intended for the use of adhesive manufacturers and for the use in timber products 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 document.

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

This document does not address the classification and use of adhesives in combination with the spraying of water before or during the bonding process; see informative Annex C of this document.

This does neither allow nor forbid the use of adhesives in combination with spraying of water.

2 Normative references

[oSIST prEN 15425:2022](https://standards.iteh.ai/catalog/standards/sist/2c044b57-c9be-4c18-8c48-acafe76dc2e1/osist-pr-en-15425-2022)

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 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*

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

EN 923:2015, *Adhesives - Terms and definitions*

EN 13183-2, *Moisture content of a piece of sawn timber - Part 2: Estimation by electrical resistance method*

EN 13183-3, *Moisture content of a piece of sawn timber - Part 3: Estimation by capacitance method*

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

EN 15416-1, *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 (Glass house test)*

EN 15416-3, *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*

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

EN 15416-5, *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, *Plastics - Resins in the liquid state or as emulsions or dispersions - Determination of apparent viscosity using a single cylinder type rotational viscometer method (ISO 2555)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923:2015 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

one component polyurethane (PUR) adhesive

isocyanate containing 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, modified – Indoor conditions added in Note 1 to entry]

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 %.

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[SOURCE: EN 1995-1-1:2004, 2.3.1.3, modified – Covered exterior conditions added in Note 1 to entry]

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, modified – Note 1 to entry has been added]

3.5**glue line**

adhesive layer between the wood members

3.6**bond line**

glue line including the two intermediate zones between adhesive and wood

3.7**close contact glue line****cc**

glue line of thickness maximum 0,1 mm in the test

Note 1 to entry: Close contact glue line can be achieved by gluing together two plane wood members with a clamping pressure of $(0,8 \pm 0,1)$ N/mm² without grooves, spacers or similar device.

3.8**thick glue line**

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

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.

3.9**adhesive product line**

series of products, all with the same chemical composition except for a different amount of catalyst

Note 1 to entry: Only for this reason the products have different reactivity.

3.10**primer treatment**

application of a coating (primer) substance to both adherend surfaces, prior to the application of an adhesive to improve adhesion and/or durability of the bond

Note 1 to entry: This does not include application of pure water.

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).

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

Each area of application and use shall be given in the designation code of the adhesive.

Table 1 — Adhesive classes

Adhesive type designation	Application area	Max. test temperature ^a °C	Max. glue line thickness		Service classes ^b
			Test mm	Use mm	
EN 15425 I 70 GP 0,3	Normal use General purpose	70	0,5	0,3	1, 2, 3
EN 15425 I 90 SP 0,5	Special use Special purpose	90	1,0	0,5	1, 2, 3
EN 15425 I 70 SP 0,5	Special purpose	70	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 FJ 0,1	Finger-jointing	70	0,3	0,1	1, 2, 3
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 EN 302-8:2017 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.

A classification to a certain “maximum test temperature” will automatically be valid for lower temperatures.

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