

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15425:2017 sisaldab Euroopa standardi EN 15425:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 15425:2017 consists of the English text of the European standard EN 15425:2017.
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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-Klebstoffe auf Polyurethanbasis (PUR) für tragende Holzbauteile - Klassifizierung und Leistungsanforderungen

This European Standard was approved by CEN on 14 November 2016.

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This European Standard exists 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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European foreword

This document (EN 15425:2017) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

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.

This document supersedes EN 15425:2008.

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

- a) terms and definitions have been written in details in Clause 3, not only referring to EN 923:2015;
- 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. Adhesives tested for working properties according to Clause 7 will be marked with a “w” in the end of their designation code;
- 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 (Glass house test – EN 15416-1:2017);
- f) the test method EN ISO 2555 has been included in 7.2;
- 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 bond line specimens in compression shear* has been introduced to the EN 302 series as EN 302-8:2017;
- i) in 5.6 - Static load test of multiple glue line specimens in compression shear - a definition is given for a failure mode which leads to a not counted sample;
- j) a new Clause 8 – Marking and labelling – has been introduced;
- k) a test program for adhesives with identical chemical composition except for a different amount of catalyst, has been introduced in Clause 4;
- l) in 5.6, a more precise description of failure modes and their influence is given.

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 15425:2017),
- seven test methods (EN 302-1, EN 302-2, EN 302-3, EN 302-4, EN 302-8:2017, EN 15416-1:2017 (“Glass house test”) and EN 15416-3:2017) 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 15416-4:2017, and EN 15416-5:2017) to characterize the working properties of the adhesives.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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*

EN 302-8:2017, *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 15416-1:2017, *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 15416-3:2017, *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 15416-4:2017, *Adhesives for load bearing timber structures other than phenolic and aminoplastic — Test methods — Part 4: Determination of open assembly time under referenced conditions*

EN 15416-5:2017, *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 923:2015 and the following apply.

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 %.

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