Two-component epoxy and polyurethane adhesives for on-site repair of cracked timber structures - Testing, requirements and repair strength verification

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 17418:2021 sisaldab Euroopa standardi EN 17418:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 17418:2021 consists of the English text of the European standard EN 17418:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.03.2021.	Date of Availability of the European standard is 24.03.2021.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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English Version

Two-component epoxy and polyurethane adhesives for on-site repair of cracked timber structures - Testing, requirements and repair strength verification

Adhésifs bicomposants polyuréthanes et époxydiques pour la réparation sur site de structures en bois fissurées - Essais, exigences et vérification de la résistance des réparations

Zwei-Komponenten-Epoxid- und Zwei-Komponenten-Polyurethan-Klebstoffe zur Reparatur von beschädigten Holzbauteilen auf der Baustelle - Prüfung, Anforderungen und Nachweis der Reparatur-Festigkeit

This European Standard was approved by CEN on 8 February 2021.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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 COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 17418:2021) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by UNE.

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 September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies test methods and requirements for two-component epoxy and polyurethane adhesives for on-site repair of cracks in timber structures made of strength graded structural timber with rectangular cross-section, structural finger-jointed timber, glued solid timber and glued laminated timber made of softwood species by injection of the repair adhesive with glue line thicknesses up to 8 mm. The adhesive can also be used to rehabilitate cracks in the area of joints made by nails, screws, dowel-type fasteners and dowels with threads. The adhesive can also be used to fill gaps between the faces of structural components. This document addresses exclusively adhesives which fulfil the requirements according to Clause 8.

NOTE There is no sufficient experience with adhesives which do not fulfil the requirements in 8.4.4.

This document also covers the repair of surface treated wood. It does not cover the repair of preservative treated wood, modified and stabilized wood with considerably reduced swelling and shrinkage properties, e.g. acetylated wood, heat treated wood and polymer impregnated wood.

The adhesive is intended for the repair of load bearing timber structures not subjected to temperatures more than 60 °C over a longer time in service classes 1 and 2 according to EN 1995-1-1 which are loaded predominantly static or non-fatigue quasi static, see EN 1990 and EN 1991-1-1. A verification of quality and bond line integrity of the on-site repair bonding is given in an informative Annex A.

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

EN 302-6, *Adhesives for load-bearing timber structures — Test methods — Part 6: Determination of the minimum pressing time under referenced conditions*

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 383, *Timber Structures — Test methods — Determination of embedment strength and foundation values for dowel type fasteners*

EN 408, *Timber structures — Structural timber and glued laminated timber — Determination of some physical and mechanical properties*

EN 923, *Adhesives — Terms and definitions*

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

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

EN 14358, *Timber structures — Calculation and verification of characteristic values*

EN 17334:2021, *Glued-in rods in glued structural timber products — Testing, requirements and bond shear strength classification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923 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 http://www.electropedia.org/

3.1
two component epoxy adhesive
thermosetting synthetic resin derived from an exothermic polymerization reaction of an epoxide group with amines, acid anhydrides, phenols, alcohols or thiols

3.2
two component polyurethane adhesive
2C-PUR
urethane polymers which are cross-linked by the reaction between polyol or polyamine with isocyanate

3.3
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]

3.4
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 softwoods will not exceed 20 %.

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

3.5
service class 3
climatic conditions leading to a higher moisture contents than in service class 2

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