

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

## EESTI STANDARDI EESSÕNA

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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.

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

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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of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.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.

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## 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]