



SLOVENSKI STANDARD
SIST EN 302-1:2013

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Nadomešča:
SIST EN 302-1:2004

Lepila za nosilne lesene konstrukcije - Preskusne metode - 1. del: Ugotavljanje vzdolžne natezne strižne obremenitve

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

Klebstoffe für tragende Holzbauerteile - Prüfverfahren - Teil 1: Bestimmung der Längszugscherfestigkeit

Adhésifs pour structures en bois - Méthodes d'essais - Partie 1: Détermination de la résistance du joint au cisaillement en traction longitudinale

Ta slovenski standard je istoveten z: EN 302-1:2013

ICS:

83.180	Lepila	Adhesives
91.080.20	Lesene konstrukcije	Timber structures

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 302-1

March 2013

ICS 83.180

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English Version

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

Adhésifs pour structures en bois - Méthodes d'essais -
Partie 1: Détermination de la résistance du joint au
cisaillement en traction longitudinale

Klebstoffe für tragende Holzbauteile - Prüfverfahren - Teil 1:
Bestimmung der Längszugscherfestigkeit

This European Standard was approved by CEN on 5 February 2013.

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.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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Foreword

This document (EN 302-1:2013) 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 September 2013 and conflicting national standards shall be withdrawn at the latest by September 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 302-1:2004.

The following modifications have been made:

- Two new clauses (Terms and definitions and Symbols) are introduced in this revised standard;
- Thick glue line is now prepared with thicknesses between 0,3 mm and 2,0 mm depending on type of adhesive;
- There has been given more detailed instructions on how to prepare thick glue line;
- The condition period for bonded assemblies has been increased.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 302-1:2013 (E)**Introduction**

This document is one of a series dealing with adhesives for use with timber structures, and is published in support of EN 1995, *Eurocode 5: Design of timber structures*. The series consists of three classification and performance requirements for adhesives for load-bearing timber structures, phenolic and aminoplastic adhesives (EN 301), one component polyurethane adhesives (EN 15425) and emulsion polymerised isocyanate adhesives (prEN 16254), together with eleven test methods (EN 302 Parts 1 to 7 and EN 15416 Parts 2 to 5).

These European Standards have the following titles:

EN 301, *Adhesives, phenolic and aminoplastic, for load-bearing timber structures — Classification and performance requirements*

EN 15425, *Adhesives — One component polyurethane for load bearing timber structures — Classification and performance requirements*

prEN 16254, *Adhesives — Emulsion polymerized isocyanate (EPI) for load-bearing timber structures — Classification and performance requirements*

EN 302, *Adhesives for load-bearing timber structures — Test methods*

— *Part 1: Determination of longitudinal (tensile shear strength*

— *Part 2: Determination of resistance to delamination*

— *Part 3: Determination of the effect of acid damage to wood fibres by temperature and humidity cycling on the transverse tensile strength*

— *Part 4: Determination of the effects of wood shrinkage on the shear strength*

— *Part 5: Determination of maximum assembly time under referenced conditions*

— *Part 6: Determination of the minimum pressing time under referenced conditions*

— *Part 7: Determination of the working life under referenced conditions*

EN 15416, *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*

— *Part 3: Creep deformation test at cyclic climate conditions with specimens loaded in bending shear*

— *Part 4: Determination of open assembly time for one component polyurethane adhesives*

— *Part 5: Determination of conventional pressing time*

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 standard can have a negative environmental impact. As technological advantages lead to better alternatives for these materials, they will be eliminated from this standard to the greatest extent possible.

At the end of the test, it is recommended that the user of the standard take care to carry out an appropriate disposal of the wastes, according to local regulations.

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EN 302-1:2013 (E)**1 Scope**

This European Standard specifies a method for determining the shear strength of adhesive bonds in close contact glue line and thick glue line.

It is suitable for the following applications:

- a) for assessing the compliance of adhesives with EN 301, EN 15425 and prEN 16254;
- b) for assessing the suitability and quality of adhesives for load-bearing timber structures.

This test is intended primarily to obtain performance data for the classification of adhesives for load-bearing timber structures according to their suitability for use in defined climatic environments.

This method is not intended for use to provide for structural design, and does not necessarily represent the performance of the bonded member in service.

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 301, *Adhesives, phenolic and aminoplastic, for load-bearing timber structures — Classification and performance requirements*

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

ISO 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

ISO 6344-2, *Coated abrasives — Grain size analysis — Part 2: Determination of grain size distribution of macrogrits P12 to P220*

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
glue line**

adhesive layer between the wood members

**3.2
thick glue line**

glue line of nominal thickness in the range of 0,3 mm to 2,0 mm at the time of bonding

Note 1 to entry: Thick glue lines are achieved by using spacers, grooves or similar devices with a thickness of 0,3 mm to 2,0 mm when two plain members are glued together.

**3.3
close contact glue line**

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 $(0,8 \pm 0,1)$ N/mm² without additional grooves, spacers or similar devices.

4 Symbols

A	bonded test surface, in mm ² ;
f_v	shear strength, in N/mm ² ;
F_{\max}	the applied load at failure, in N;
h	depth of groove for thick glue line, 0,3 mm, 0,5 mm, 1,0 mm or 2,0 mm;
α	angle between the annual growth rings and bonded surface, 30° to 85°;
l_1	length of test pieces, (150 ± 5) mm;
l_2	length of overlap (length of tested surface), $(10,0 \pm 0,1)$ mm;
l_3	width of groove for thick glue line, ≈ 14 mm;
b	width of test pieces, $(20,0 \pm 0,1)$ mm;
t	thickness of panel for close contact glue line, $(5,0 \pm 0,1)$ mm;
$t + h$	thickness of panel outside the grooves for thick glue line, in mm.

5 Principle

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The shear strength of adhesive bonds is determined by applying a longitudinal tensile force to a single lap joint with close contact or thick glue lines between two rectangular wooden adherends made of beech (*Fagus sylvatica* L). The joints are loaded to rupture.

6 Apparatus

The testing machine shall be either:

- capable of maintaining a constant rate of loading of $(2,0 \pm 0,5)$ kN/min; or
- capable of maintaining constant crosshead speed as described in ISO 5893.

The jaws of the testing machine shall grip the test pieces firmly and prevent slippage during loading. The grip shall be fixed in hinged manner.

7 Method

7.1 Preparation of panels

By planing, prepare a sufficient number (see 7.4) of panels to be bonded, with or without 14 mm wide grooves as shown in Figure 1, from an untreated straight-grained board of beech (*Fagus sylvatica* L.) with a density of (700 ± 50) kg/m³ at (12 ± 1) % moisture content. Ensure that the angle, α , between the growth rings and the surface to be bonded, see Figure 3 a), is between 30° and 85°.