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NSAI Standards

Irish Standard
I.S. EN 302-3:2017

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

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This document is based on:	*Published:*
EN 302-3:2017	2017-09-06

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2017-09-24	83.180
	NOTE: If blank see CEN/CENELEC cover page

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National Foreword

I.S. EN 302-3:2017 is the adopted Irish version of the European Document EN 302-3:2017, 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

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 302-3

September 2017

ICS 83.180

Supersedes EN 302-3:2013

English Version

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

Adhésifs pour structures portantes en bois - Méthodes d'essai - Partie 3: Détermination de l'influence de l'attaque d'acide des fibres de bois, résultant de traitements cycliques en température et humidité sur la résistance à la traction transversale

Klebstoffe für tragende Holzbauteile - Prüfverfahren - Teil 3: Bestimmung des Einflusses von Säureschädigung der Holzfasern durch Temperatur- und Feuchtezyklen auf die Querzugfestigkeit

This European Standard was approved by CEN on 9 July 2017.

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European foreword

This document (EN 302-3:2017) 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of an identical text or by endorsement, at the latest by March 2018, and conflicting national standards shall be withdrawn at the latest by March 2018.

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 302-3:2013.

Compared to EN 302-3:2013 the following modification has been made:

a) EN 15416-2 is replaced by EN 302-8, *Adhesives for load-bearing timber structures — Test methods — Part 8: Static load test of multiple bond line specimens in compression shear*;

b) specification of beech for test pieces for gap filling adhesives in 5.1;

c) reparation of test pieces for gap filling adhesives added in 5.2;

d) description of climate cycling test in 5.5 completed.

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.

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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 polymerized isocyanate adhesives (EN 16254), and all together twelve test methods (EN 302-1, EN 302-2, EN 302-3, EN 302-4, EN 302-5, EN 302-6, EN 302-7 and EN 302-8, and EN 15416-1, EN 15416-3, EN 15416-4 and EN 15416-5).

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 (PUR) for load bearing timber structures — Classification and performance requirements*

EN 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*

— *Part 8: Static load test of multiple bond line specimens in compression shear*

EN 15416, *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 loaded perpendicular to the glue line (Glasshouse test)*

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

— *Part 4: Determination of open assembly time under referenced conditions*

— *Part 5: Determination of minimum pressing time under referenced conditions*

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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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1 Scope

This European Standard specifies a method for determining the effect on bond strength of damage to wood fibres caused by the action of acids from the adhesive or primer used in the gluing process during climatic cycling.

It is suitable for the following applications:

a) for assessing the compliance of adhesives with EN 301, EN 15425 and EN 16254;

b) for assessing the suitability and quality of adhesives for load-bearing timber structures;

c) for determining if the adhesive after bonding has a damaging influence on the strength of the wood due to chemical action.

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 test is carried out on Norway spruce (*Picea abies* L.) or Beech (*Fagus sylvatica* L.).

This method is not intended for use to provide numerical design data 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 1245, *Adhesives - Determination of pH*

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

3 Principle

A joint between wooden adherends is submitted to defined temperature and humidity cycles and then strained to failure by a transverse tensile load.

4 Apparatus

4.1 Testing machine, which shall be either:

a) a constant rate of loading machine, capable of maintaining a rate of loading of (5 ± 1) kN/min; or

b) a constant rate of traverse machine as described in ISO 5893.

Special mounts are required (see Figure 1). One or both mounts shall be attached to the straining heads by a coupling, which permits self-alignment of the mounts whilst the test pieces are being pulled.

4.2 Climatic cabinets, which are enclosures with air circulation capable of maintaining the test pieces under the following conditions:

a) (10 ± 2) °C at approximately (87,5 ± 2,5) % relative humidity;

b) (50 ± 2) °C at approximately (87,5 ± 2,5) % relative humidity;

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