



**NSAI**  
Standards

Irish Standard  
I.S. 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

**I.S. EN 15416-4:2017**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

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## National Foreword

I.S. EN 15416-4:2017 is the adopted Irish version of the European Document 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

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 15416-4**

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English Version

**Adhesives for load bearing timber structures other than  
phenolic and aminoplastic - Test methods - Part 4:  
Determination of open assembly time under referenced  
conditions**

Adhésifs pour structures portantes en bois de type  
autre que phénolique et aminoplaste - Méthodes  
d'essais - Partie 4 : Détermination du temps  
d'assemblage ouvert dans des conditions de référence

Klebstoffe für tragende Holzbauteile ausgenommen  
Phenolharzklebstoffe und Aminoplaste - Prüfverfahren  
- Teil 4: Bestimmung der offenen Wartezeit bei  
Referenzbedingungen

This European Standard was approved by CEN on 30 October 2016.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (EN 15416-4:2017) 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 15416-4:2006.

Compared to EN 15416-4:2006, the following main modifications have been made:

- a) title has been changed;
- b) 7.2 covering failure mode has been introduced;
- c) new definition of open assembly time has been given in 3.1;
- d) time intervals for open assembly times in Table 1 divided into slow and fast systems;
- e) requirement has been added as Clause 8.

This document is one of a series dealing with adhesives for use with timber structures, and is published in support of product standards for bonded load-bearing 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), together with 12 test methods (EN 302 Parts 1 to 8 and EN 15416 Parts 1 and 3 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 (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 302-1, *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*

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- 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 302-5, *Adhesives for load-bearing timber structures — Test methods — Part 5: Determination of maximum assembly time under referenced conditions*
- 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 15416-1, *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, *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, *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, *Adhesives for load bearing timber structures other than phenolic and aminoplastic — Test methods — Part 5: Determination of minimum pressing time under referenced conditions*

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.

**EN 15416-4:2017 (E)****1 Scope**

This European Standard specifies a laboratory method of determining the open assembly time in standard climate ( $20 \pm 2$ ) °C and ( $65 \pm 5$ ) % relative humidity (hereafter climate [20/65]).

This European Standard is intended to determine the open assembly time using a defined procedure for obtaining a reliable base for comparison of open assembly time between adhesives under referenced conditions.

The method gives a result that cannot be applied to the safe manufacture of timber structures without taking into account the influence of factors such as timber density, moisture content, factory temperature and relative air humidity.

**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 302-1:2013, *Adhesives for load-bearing timber structures — Test methods — Part 1: Determination of longitudinal tensile shear strength*

EN 923:2015, *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 923:2015 and the following apply.

**3.1****open assembly time**

time interval under specified conditions from adhesive spread until the surfaces to be bonded are joined

**4 Principle**

Standard beech lap joints are tested in tensile shear after various open assembly times until it is found that the shear strength value is below  $10 \text{ N/mm}^2$ , the coefficient of variation increases considerably or the failure mode changes considerably.

**5 Apparatus**

The testing machine shall be

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

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