

**Adhesives for load bearing timber structures- Test methods- Part 4:  
Determination of open assembly time  
for one component polyurethane  
adhesives**

Adhesives for load bearing timber structures- Test methods- Part 4: Determination of open assembly time for one component polyurethane adhesives

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 15416-4:2006 sisaldab Euroopa standardi EN 15416-4:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 20.09.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 15416-4:2006 consists of the English text of the European standard EN 15416-4:2006.</p> <p>This document is endorsed on 20.09.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> This document specifies a method of determining the open assembly time in a standard climate.</p>	<p><b>Scope:</b> This document specifies a method of determining the open assembly time in a standard climate.</p>
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**ICS** 83.180

**Võtmesõnad:**

English Version

**Adhesives for load bearing timber structures other than phenolic  
and aminoplastic - Test methods - Part 4: Determination of open  
assembly time for one component polyurethane adhesives**

Adhésifs pour structures portantes en bois de type autre  
que phénolique et aminoplaste - Méthodes d'essai - Partie  
4 : Détermination du temps d'assemblage ouvert pour les  
adhésifs à base de polyuréthane monocomposants

Klebstoffe für tragende Holzbauteile ausgenommen  
Phenolharzklebstoffe und Aminoplaste - Prüfverfahren -  
Teil 4: Bestimmung der offenen Wartezeit für  
Einkomponenten-Klebstoffe auf Polyurethanbasis

This European Standard was approved by CEN on 18 May 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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## Foreword

This document (EN 15416-4:2006) 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 February 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

This document is one of a series dealing with test methods for adhesives for use in load bearing timber structures. The standard is published in support of Eurocode 5, Common unified rules for timber structures. The series consists of seven test methods to assess the performance of adhesives after specified heat and humidity treatments:

EN 302-1, Adhesives for load-bearing timber structures – Test methods – Part 1: Determination of bond strength in 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;

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

prEN 15416-1, Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 1: Static load test of single bondline specimens in compression shear;

prEN 15416-2, 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;

prEN 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;

and two test methods to characterize the working properties of the adhesive:

EN 15416-4, Adhesives for load bearing timber structures other than phenolic and aminoplastic – Test methods - Part 4: Determination of open assembly time for one component polyurethane adhesives;

EN 15416-5, Adhesives for load bearing timber structures other than phenolic and aminoplastic – Test methods - Part 5: Determination of conventional pressing time.

Requirements for the adhesives are stated in other documents, for instance requirements for one component polyurethane adhesives for load bearing timber structures are given in prEN 15425.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## **SAFETY STATEMENT**

Persons using this document should be familiar with the normal laboratory practice, if applicable. This document does not purport to 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.

## 1 Scope

This document specifies a method of determining the open assembly time in a standard climate.

This document is intended to determine the open assembly time for one component polyurethane adhesives using a defined procedure for obtaining a reliable base for comparison of open assembly time between adhesives. 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 referenced documents are indispensable for the application 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 301:2006, *Adhesives, phenolic and aminoplastic, for load-bearing timber structures - Classification and performance requirements*

EN 302-1:2004, *Adhesives for load bearing timber structures - Test methods - Part 1: Determination of bond strength in longitudinal tensile shear strength*

EN 923:2005, *Adhesives – Terms and definitions*

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

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923:2005 and the following apply.

### 3.1

#### **open assembly time**

longest open assembly time (expressed as the mean of 10 individual results) that gives a tensile shear strength of at least 10 N/mm<sup>2</sup> in a standard climate (20 °C and 65 % RH) with normal coefficient of variation and normal failure mode compared to the results obtained under optimal conditions.

## 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 N/mm<sup>2</sup>, the coefficient of variation increases considerably or the failure mode changes considerably.

## 5 Apparatus

The testing machine shall be either:

- a) constant rate of loading machine capable of maintaining a rate of loading of (2,0±0,5) kN/min; or,
- b) constant rate of traverse machine as described in ISO 5893.