SLOVENSKI STANDARD
kSIST prEN 16556:2014

01-september-2014

Lepila - Ugotavljanje odprtega časa plastomernih lepil za les za nekonstrukcijsko uporabo

Adhesives - Determination of the open assembly time for thermoplastic wood adhesives for non-structural applications

Klebstoffe - Bestimmung der offenen Wartezeit bei thermoplastischen Holzklebstoffen für nicht tragende Anwendungen

Adhésifs - Détermination du temps d'assemblage ouvert des adhésifs thermoplastiques pour bois pour applications non structurales

Ta slovenski standard je istoveten z: **FprEN 16556**

ICS:

83.180	Lepila	Adhesives

kSIST prEN 16556:2014 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

FINAL DRAFT
FprEN 16556

June 2014

ICS 83.180

English Version

Determination of the maximum open time for thermoplastic wood adhesives for non-structural applications

Détermination du temps ouvert maximal des adhésifs thermoplastiques pour bois pour applications non structurales

Bestimmung der maximalen offenen Wartezeit bei thermoplastischen Holzklebstoffen für nicht tragende Anwendungen

This draft European Standard is submitted to CEN members for formal vote. It has been drawn up by the Technical Committee CEN/TC 193.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (FprEN 16556:2014) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

This document is currently submitted to the Formal Vote.

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

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

1 Scope

This European Standard defines the test method for the determination of the maximum open time for thermoplastic wood adhesives for non-structural applications by tensile shear strength. It is carried out on standardized test pieces glued with increasing open times.

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 923, *Adhesives - Terms and definitions*

EN 1067, *Adhesives - Examination and preparation of samples for testing*

EN ISO 15605, *Adhesives - Sampling (ISO 15605)*

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 and the following apply.

3.1
maximum open time
the longest time within which two wooden adherends, where the adhesive is applied, can remain decoupled ensuring a tensile force value ≥ 10 N/mm^2 and a wood failure > 0 %

Note 1 to entry: The open time is expressed in minutes (min).

4 Symbols and abbreviations

A	bonded test surface, in mm²;
a	thickness of bond-line, in mm;
α	angle between growth ring and surfaces to be bonded, in °;
b	width of test piece, in mm;
F_{max}	the applied load at failure, in N;
l_1	length of test piece, in mm;
l_2	length of overlap (length of tested surface), in mm;
s	thickness of the panels, in mm;
τ	shear strength, in N.

5 Sampling

Samples of the adhesive shall be taken according to EN ISO 15605 and prepared for testing according to EN 1067.

6 Principle

A symmetrical bonded single lap joint between two wooden adherends glued with increasing open times, is strained to rupture by a tensile force parallel to the grain.

7 Apparatus

a) Conditioning room capable of ensuring to the test pieces the temperature at (23 ± 2) °C and (50 ± 5) % relative humidity or (20 ± 2) °C and (65 ± 5) %.

b) Notched trowel suitable to apply on the surface of the boards the required adhesive amount.

c) The testing machine shall be a constant-rate-of-traverse machine as described in ISO 5893. The machine shall be capable to apply a rate of 50 mm/min. The machine shall apply a force of at least 5 kN ± 2%.

d) The jaws shall grip the test pieces with a wedge action and permit self alignment whilst the test pieces are being pulled.

e) Apparatus suitable to obtain individual test pieces from the boards coupled as reported in 8.2, for example a circular saw fitted with blade having a thickness of cut of about 2,5 mm.

f) Press suitable to glue two boards (8.1) as indicated in 8.2 with the required pressure.

8 Procedure

8.1 General

Cut two panels (see Figure 1) from a thick unsteamed, conditioned, straight-grained board of beech (Fagus sylvatica L.) with a density of (700 ± 50) kg/m^3 when the moisture content is (12 ± 1) %.

Ensure that the angle between the growth rings and the surface to be bonded is between 30º and 90º.

Condition the boards for at least 7 days in 7 a) conditions. The adhesive shall be conditioned for at least 24 h.

Not more than 24 h before bonding, either lightly plane or lightly sand each surface to be bonded (using an abrasive paper of grain size P100 complying with ISO 6344-2 is recommended). Remove any dust carefully. Do not touch or soil the prepared surfaces.

8.2 Preparation of test pieces

All the adhesive application procedures shall be carried out in the standard atmosphere (see 7a)). Assembly instructions:

— The adhesive application shall be on one adherend only.

— The adhesive spread shall be (150 ± 10) g/m^2. The distribution of the adhesive shall be uniformly done over the whole surface of the board.

— Immediately after the adhesive application has been completed, the measurement of the open time shall start.

— The closed assembly time shall be (180 ± 30) s.

— The pressing pressure shall be (0,8 ± 0,1) N/mm^2.

— The pressing time shall be a minimum of 2 h.

Assemble the boards at increasing open times (2) or according to the manufacturer's instructions (range of the maximum open time to be tested and the interval).

The glued boards shall be conditioned for 7 days in standard atmosphere (see 7a)).

Cut five strips of width b = (20 ± 0,2) mm from each bonded assembly along the grain, avoiding areas within 7,5 mm of the outside long edges of the panel as shown in Figure 1. Cut these strips into test pieces of length l_1 = (150± 5) mm as shown in Figure 2 (2).

Make flat bottomed cuts of (2,5 ± 0,5) mm wide in the bonded sections across the grain so that an overlap of width l_2 = (10,0 ± 0,2) mm is defined in the middle section (see Figure 2). The cuts are to separate the wood layers. Take care that the cuts completely cut through the bond line but only penetrate as little as possible into the other part of the joint.

NOTE 1 e.g. 0-3-6-9-12 min.

NOTE 2 For a screening test only (e.g. to determine a rough value of the open time), single lap joint specimens (e.g: see EN 205:2003, Annex A), may be used.

8.3 Number of test pieces

Test a sufficient number of test pieces to provide 10 valid results for each of the open times selected.

Results from tests in which failure occurred in the wood (100 % of wood failure) at values ≤ 10 N/mm^2 shall be invalid.

8.4 Tensile shear test

Test the test pieces shown in Figure 2 in the tensile testing machine (see 7 c)).

Clamp the ends of the test pieces in the jaws of the tensile testing machine up to a length of 40 mm to 50 mm. Ensure that the force is applied centrally and in the plane of the bond. Load the test piece until rupture. Record the applied maximum force F_{max} in Newton (N).