SLOVENSKI STANDARD

SIST EN 15416-3:2008

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Lepila za nosilne lesene konstrukcije - Preskusne metode - 3. del: Preskus deformacij lezenja v cikličnih klimatskih pogojih s preskušanci pod upogibno-strižno obremenitvijo

Adhesives for load bearing timber structures - Test methods - Part 3: Creep deformation test at cyclic climate conditions with speciments loaded in bending shear

Klebstoffe für tragende Holzbauteile - Prüfverfahren - Teil 3: Prüfung der Kriechverformung unter zyklischen Klimabedingungen an Prüfkörpern bei Biege-Scherbeanspruchung

Adhésifs pour structures portantes en bois - Méthodes d'essai - Partie 3 : Essai de déformation par fluage dans des conditions climatiques cycliques avec des éprouvettes chargées en cisaillement par flexion

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Foreword

This document (EN 15416-3:2007) 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of an identical text or by endorsement, at the latest by May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

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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 European standard specifies a method for determining the creep deformation of bonded specimens loaded in bending shear. It is applicable to adhesives used in load-bearing timber structures.

It is suitable for the following applications:

a) for assessing the compliance of adhesives to prEN 15425 Adhesives, One component polyurethane, for load bearing timber structures - Classification and performance requirements;

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 to provide numerical design data and does not necessarily represent the performance of the bonded member in service. It is not applicable for assessing the suitability of adhesives for the manufacture of wood-based panels

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

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

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

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
relative creep value, $k_{def}(t)$
time-dependent increase of the deformation of one specimen

NOTE By means of the deflection $w(t)$ and the initial deflection $w(0)$, the relative creep value is calculated using the following formula:

$$k_{def}(t) = \frac{w(t)}{w(0)} - 1 \qquad (1)$$

where

$w(t)$ is the deflection at times t;

$w(0)$ is the initial deflection immediately after initial loading, measured 1 min after the loading of the individual specimen;

$k_{def}(t)$ is the relative creep value.

3.2
ratio of relative creep, $R_{Ci}(t)$
ratio of the relative creep values $k_{def}(t)$ of two matched specimens i, tested adhesive,$_i$ and PRF,$_i$, at time *t*

NOTE By means of $k_{def}(t)$,tested adhesive,i and $k_{def}(t)$,PRF,i within one pair of matched bending specimens (i), the ratio of relative creep is calculated using the following formula:

$$R_{Ci}(t) = \frac{k_{def}(t), tested\ adhesive, i}{k_{def}(t), PRF, i} \quad (2)$$

where

$k_{def}(t)$, tested adhesive,i is the relative creep value of the respective tested adhesive sample i;

$k_{def}(t)$, PRF,i is the relative creep value of the respective phenolic-resorcinol (PRF) - sample i;

$R_{Ci}(t)$ is the ratio of relative creep of matched pair of bending specimens i.

4 Principle

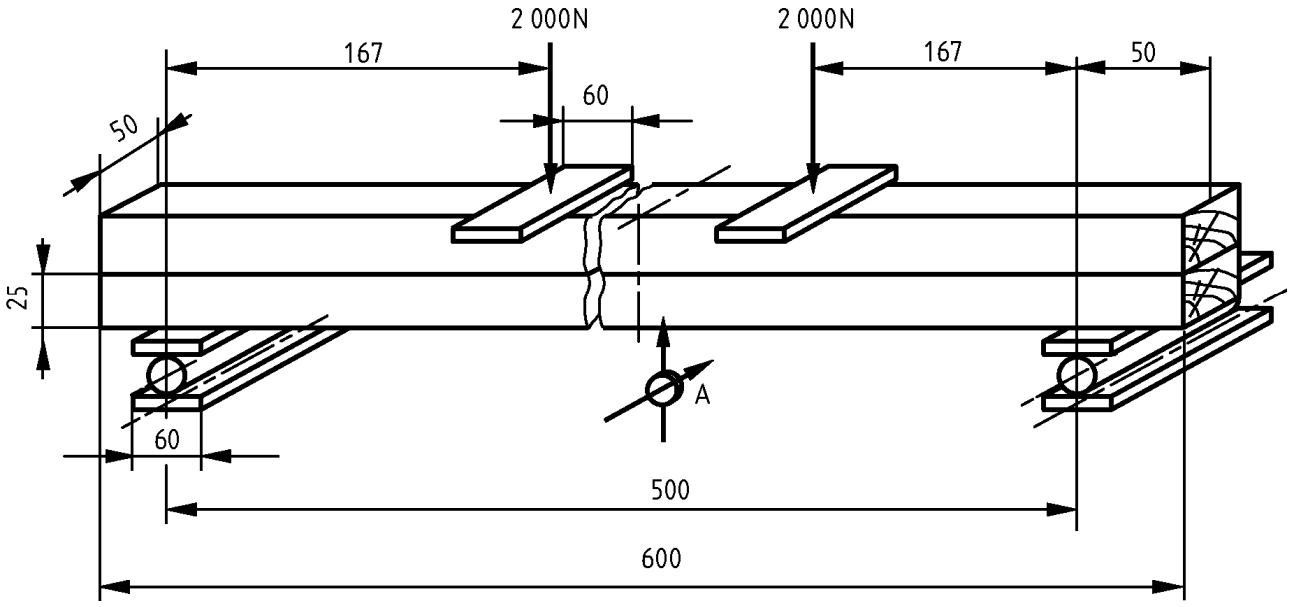
Bending specimens of a constant cross-section are subjected to constant load at cyclically varying climate conditions. Specimens bonded with the adhesive to be tested are compared with specimens bonded with a PRF- adhesive conforming to the requirement of adhesive type I as specified in EN 301.

5 Apparatus

5.1 Test jig

A test jig being capable of applying a load of 2 000 N in each loading point with a loading principle as shown in Figure 1.

Dimensions in millimetres



Key

A Measuring gauge for the measuring of the deflection of the specimen

Figure 1 — Loading principle for the bending test

5.2 Climate chamber

A climate chamber capable of maintaining the two test climates (20 ± 2) °C and (85 ± 5) % RH and (45 ± 2) °C and (40 ± 5) % RH. The climate chamber shall be capable of alternating between the two test climates in 10 h.

5.3 Measuring gauge

A measuring gauge enabling readings of the deflection of the specimens with an accuracy of 0,01 mm, see Figure 1.

6 Preparation of test samples

Five boards of straight grained, defect-free spruce wood (*Picea abies* L.) with a density of (425 ± 25) kg/m^3 shall be used to manufacture a total of 5 pairs of matched bending specimens with thin bondlines.

Each board shall have a width of at least 150 mm, a length of at least 1 260 mm and a thickness of at least 33 mm, and shall be used to manufacture one pair of 2 matched bending specimens according to the scheme shown in Figure 2.

Each of the 2 matched bending specimens consists of 2 boards of spruce wood of equal sizes. Each board shall have a thickness of (25 ± 0,1) mm (after final planning), a width of at least 70 mm (before the bonding) and a length of at least 625 mm (before the bonding), with an angle of the growth rings between 30 ° and 60 ° (in relation to the surface to be bonded).

Each specimen is glued from the two boards with an orientation of the growth rings as shown in Figure 2. One specimen of the pair shall be glued with the adhesive tested for assessment and the other specimen of the

pair shall be glued with an adhesive of thermosetting phenolic-resorcinol type conforming to the requirements for an adhesive of type I as specified in EN 301.

The adhesives shall be used in accordance with the recommendations of the adhesive manufacturer. The assemblies shall be produced with maximum closed assembly time as recommended by the adhesive manufacturer.

After pressing and curing for at least seven days in standard climate (20 ± 2) °C and (65 ± 5) % RH, the specimens are planed to a final width of (50 ± 0,1) mm and cut to a final length of (600 ± 1,0) mm, ensuring that the spacer frame at the periphery is cut off completely from the test specimen. The thickness of the samples shall not be changed after bonding in order to provide samples with a thickness of (50 ± 0,1) mm.