



# SLOVENSKI STANDARD

## SIST EN 14292:2005

01-oktober-2005

Adhesives - Wood adhesives - Determination of static load resistance with increasing temperature

Adhesives - Wood adhesives - Determination of static load resistance with increasing temperature

Klebstoffe - Holzklebstoffe - Bestimmung der Beständigkeit gegen statische Belastung in der Wärme

Adhésifs - Adhésifs pour bois - Détermination de la résistance à la charge statique sous augmentation de température

Ta slovenski standard je istoveten z: EN 14292:2005

### ICS:

83.180

Lepila

Adhesives

SIST EN 14292:2005

en

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14292**

June 2005

ICS 83.180

English version

**Adhesives - Wood adhesives - Determination of static load  
resistance with increasing temperature**

Adhésifs - Adhésifs pour bois - Détermination de la  
résistance à la charge statique sous augmentation de  
température

Klebstoffe - Holzklebstoffe - Bestimmung der Beständigkeit  
gegen statische Belastung in der Wärme

This European Standard was approved by CEN on 24 March 2005.

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

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## Foreword

This European Standard (EN 14292:2005) 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 December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005.

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

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**EN 14292:2005 (E)****1 Scope**

This European Standard specifies a test method to determine the heat resistance of wood adhesives under static load and increasing temperature conditions. The test assesses the adhesive's ability to resist sustained or continuous loading at temperatures well above normal room temperature, or in conditions where service temperatures are variable or cyclic.

**NOTE** The procedure described is based on a test developed in Switzerland, known as the HRT'92 test. It uses test pieces described in EN 302-1 and EN 205, a static loading device and a means for increasing test pieces temperature at a specific rate.

**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 205, *Adhesives — Wood adhesives for non-structural applications — Determination of tensile shear strength of lap joints*

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

EN 923:1998, *Adhesives — Terms and definitions*

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**3 Terms and definitions**

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For the purposes of this European Standard the terms and definitions given in EN 923:1998 apply.

<http://eur-lex.europa.eu/legal-content/EN/standards/and/definitions/EN/EN-923-1998/c6cae84e6d02/sist-en-14292-2005>

**4 Safety**

Persons using this standard shall be familiar with the normal laboratory practice.

This standard does not purport to address all the safety problems, if any, associated with its use.

It is the responsibility of the user to establish health and safety practices and to ensure compliance with any European or national regulatory conditions.

**5 Principle**

A lap joint between two wooden adherents is loaded in a climatically controlled environment by a constant leverage and strained to rupture under increasing temperature.

**6 Apparatus**

**6.1 Oven**, equipped with air circulation and a controlling device to increase the oven temperature at a constant rate ( $50 \pm 2$ ) °C/h.

**NOTE** To ensure a constant temperature gradient feed-back from the temperature sensor within the oven should be provided to the oven temperature control system.

**6.2 Load device**, as shown in Figure 1.

**6.3 Weight**, 2 kg, with means of attachment to the lever arm.

**6.4 Stopwatch**, connected to a switch fixed at the load device.

## 7 Sample preparation

### 7.1 Preparation of test pieces

Prepare nine test pieces as described in EN 302-1 or EN 205, but with modification as follows. In difference to the specification given in EN 302-1, the flat bottomed cuts across the grain shall be  $(5 \pm 0,5)$  mm. The test pieces used shall be cut to a length of 90 mm (see Figure 2).

Where no manufacturer's instructions are available, use the bonding procedure specified below. The surface to be bonded shall be situated exactly in the middle of the test pieces.

Comply with the adhesive manufacturer's instructions regarding the processing conditions, including the preparation of the adhesive, the amount of adhesive to be applied, whether the adhesive is to be applied on one or both surfaces, the open and closed assembly time and the magnitude and duration of the assembly pressure and report them in the test report.

### 7.2 Conditioning bonded assemblies / test pieces

After bonding and pressing, condition the bonded assemblies or test pieces for a minimum of seven days (close contact joints) to 14 days (gap joints) in a standard atmosphere of  $(20 \pm 2)$  °C /  $(65 \pm 5)$  % relative humidity [20/65], or  $(23 \pm 2)$  °C /  $(50 \pm 5)$  % relative humidity [23/50].

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## 8 Test procedure

Place the load device in the oven so that the distance of the test pieces from the rear wall of the oven is between minimum 80 mm and maximum 120 mm.

Start the test at a temperature of between 23 °C and 28 °C.

Raise the lever arm and place the test piece on edge in the recess of the load device so that the lap joint is in the middle of the two supports (see Figure 1).

Start the temperature control system when the lever arm is lowered to the lap joint. At the same time start the temperature recording system and the stopwatch.

The lever arm shall exert a force  $F$  of  $(214 \pm 2)$  N on the bonded area of  $200 \text{ mm}^2$ , according to the geometry and weights of the relevant components of the load device (see Figure 1):

$$F = \frac{1}{B} \times \left( L \times A + \frac{GA \times HA}{2} - \frac{GB \times HB}{2} \right) + D$$

where

$F$  is the force on the test piece in Newtons (N)

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*B* is the distance from the centre of rotation of the lever arm to the centre of rotation of the stamp in millimetres (mm)

*A* is the distance from the centre of rotation of the lever arm to the centre of the load (mm)

*HA* is the distance from the centre of rotation to the right end of the lever arm (mm)

*HB* is the distance from the centre of rotation to the left end of the lever arm (mm)

*L* is the weight of the load (N)

*GA* is the weight of the lever arm section HA (N)

*GB* is the weight of the lever arm section HB (N)

*D* is the weight of the stamp (N)"

The weight on the lever arm exerts a load of  $(214 \pm 2)$  N on the bonded area of  $200 \text{ mm}^2$ . During the test, increase the temperature by  $(50 \pm 2) \text{ }^\circ\text{C/h}$ .

Terminate the test when the lever arm reaches a horizontal position due to rupture or extreme deformation of the adhesive bond so that the switch is activated. The final temperature can be copied directly from the temperature-recording device or calculated by the duration of the test. The measured time (in minutes) is divided by the factor 1,2 (min/ $^\circ\text{C}$ ) and added to the start temperature.

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### 9 Test report

#### 9.1 General

The items listed in subclauses 9.2 to 9.4 shall be recorded in the test report.

#### 9.2 The adhesive

- a) type and origin of the adhesive;
- b) batch number or other marking of uniquely identifying the adhesive used;
- c) number of components and working methods (procedure of preparing and applying of adhesive);
- d) durability class (for information only).

#### 9.3 Preparation of the test pieces and testing procedures

- a) species of wood with botanical name;
- b) moisture content of wood relative to oven-dry mass;
- c) characteristic data relating to the bonding procedure (for instance information about the amount of glue applied, the open and closed assembly time, pressing pressure, pressing temperature, pressing time);
- d) special treatment of the surface of the boards to be bonded;
- e) time between the termination of pressing and the cutting of the test pieces;



- f) indication whether test pieces with a thin (0,1 mm) bond-line or with a thick (1 mm) bond-line have been used;
- g) number of bonded test pieces;
- h) indication whether a climate of [20/65] or [23/50] has been used to condition the test pieces.

#### 9.4 Test results

- a) number of test pieces;
- b) temperature at failure for each test piece, rounded to 1 °C, i.e. minimum value, maximum value and mean value;
- c) standard deviations in °C;
- d) coefficient of variation, V, in %;
- e) date of test.

NOTE The result of every single test piece should be reported.

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