SLOVENSKI STANDARD
SIST EN 17618:2022

01-januar-2022

Lepila - Lepila za les za nekonstrukcijsko uporabo - Ugotavljanje strižne trdnosti s tlačno obremenitvijo

Adhesives - Wood-to-wood adhesive bonds for non-structural applications - Determination of shear strength by compressive loading

Klebstoffe - Holz-auf-Holz-Klebverbindungen für nicht tragende Anwendungen - Bestimmung der Scherfestigkeit durch Druckbelastung

Adhésifs - Joints collés de bois à bois à usages non structuraux - Détermination de la résistance au cisaillement par effort de compression

Ta slovenski standard je istoveten z: **EN 17618:2021**

ICS:

83.180	Lepila	Adhesives

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EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 17618

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English Version

Adhesives - Wood-to-wood adhesive bonds for non-structural applications - Determination of shear strength by compressive loading

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 17618:2021) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by UNE.

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of an identical text or by endorsement, at the latest by May 2022, and conflicting national standards shall be withdrawn at the latest by May 2022.

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Introduction

The test method described in this document can be used for the determination of shear strength, wood failure percentage of bonded assemblies with the aim of defining working properties of adhesives. It will allow considerable improvement in consumer protection in any future product liability system with regard to properties guaranteed by the adhesive manufacturer.

1 Scope

This document specifies a method for adhesives for wood and derived solid wood products for determining the shear strength and wood failure percentage of wood-to-wood adhesive bonds loaded in compression. These parameters allow to define different working properties of adhesives (e.g. final bond strength, pressing time, closed assembly time).

Annex A gives information required prior to testing.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 923, *Adhesives - Terms and definitions*

EN 13183-1, *Moisture content of a piece of sawn timber - Part 1: Determination by oven dry method*

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

EN ISO 7500-1:2018, *Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system (ISO 7500-1:2018)*

ISO 13061-2, *Physical and mechanical properties of wood - Test methods for small clear wood specimens - Part 2: Determination of density for physical and mechanical tests*

ISO 13061-6, *Physical and mechanical properties of wood - Test methods for small clear wood specimens - Part 6: Determination of ultimate tensile stress parallel to grain*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
thin bond line
close contact adhesive joint where the adhesive layer is nominally 0,1 mm thick

3.2
shear strength
force per surface units necessary to bring an adhesive joint to the point of failure by means of forces applied in a shear mode

[SOURCE: EN 923:2015, 2.7.17]

3.3
wood failure percentage
percentage of wood adherend failure

Note 1 to entry: Failure of a joint in the body of the adherend.

3.4
final bond strength
maximum force per surface units provided by complete processing conditions, necessary to bring an adhesive joint to the point of failure occurring in, or near the plane of the bond line

3.5
closed assembly time
interval between assembly of the adhesive joint and the initiation of the heat and/or pressure of the setting process in the assembled joint

[SOURCE: EN 923:2015, 2.6.63]

4 Principle

A bonded assembly, between two wooden blocks is loaded to rupture by a compressive shear force parallel to the grain.

5 Safety

People using this document shall be familiar with normal laboratory practice.

This document does not purport to address all the safety problems, if any, associated with this 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.

6 Apparatus

6.1 Linear measuring device

The instrument reading accuracy shall be 0,05 mm e.g. Vernier calliper or micrometer.

6.2 Testing machine

The testing machine shall be a constant-rate-of-traverse machine as described in ISO 5893. The machine shall be capable of determining a maximum load. The machine shall permit the measurement and recording of the applied force with a tolerance of ±1 % or comply with Class 1 according to EN ISO 7500-1:2018.

The testing machine shall be fitted with a shearing tool containing a self-alignement seat to ensure uniform lateral distribution of the force. The testing machine shall be located in an atmosphere such that the moisture content of the specimens developed under the conditions prescribed in 7.2 is not noticeably altered during testing.

7 Procedure

7.1 Preparation of bonded assemblies

7.1.1 General

Use wood and solid wood blocks having the parameters defined in Annex B.

The orientation of the annual rings is represented in Figure B.1.

The blocks shall not be treated or coated; it shall be freshly sanded or planed and shall be of straight-grain and free from all defects that may interfere with the bond strength determination such as: knots, birdseye, holes, cracks, bark, short grain, distorted grain, decay, any unusual discolorations within the shearing area, etc.

Any timber or wood-based/solid wood blocks may be used unless it is essential to minimize differences in the wood in order to conduct special comparative tests.

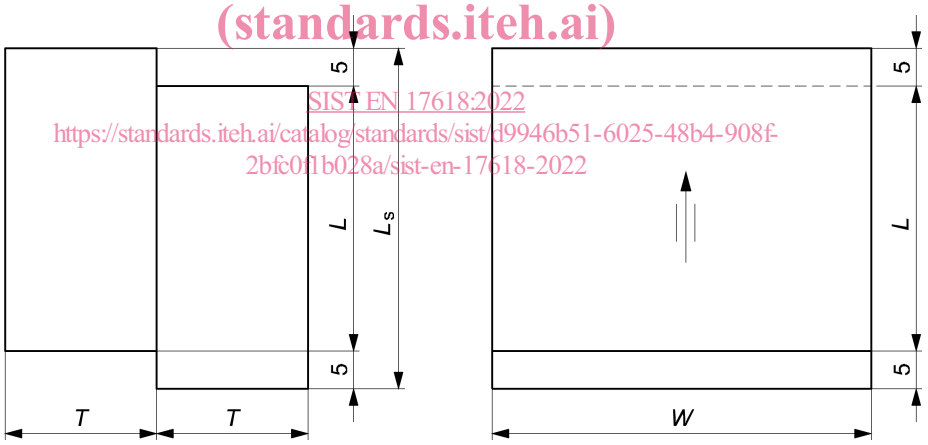
7.1.2 Test specimen

Individual test joints shall conform to the form and dimensions shown in Figure 1 + thickness 20 mm (shear area 40 mm × 50 mm).

The specimens shall be cut from bonded blocks prepared as described in 7.1.3.

Test a minimum of five test joints from each of the bonded blocks.

Dimensions in millimetres



Key

⟹	= direction of the grain
L	= length of the bonding area (40 mm)
L_S	= overall length of the specimen (L + 5 mm + 5 mm)
W	= width of the bonding area (50 mm)
T	= thickness of the block

Figure 1 — Shape and dimensions of test specimens

7.1.3 Preparation of test blocks

The blocks shall be of suitable size preferably so that at least five test specimens may be cut from one test joint as shown in Figure 2. The grain direction shall be parallel to the longest dimension of the block. The blocks shall be at the equilibrium moisture content recommended by the manufacturer of the adhesive.

In the absence of such recommendation, the moisture content shall be from (10 ± 2) % based on oven-dry weight as determined on representative samples in accordance with EN 13183-1.

The blocks shall have surfaces substantially free from saw marks. The blocks shall be weighed and assembled in pairs so that blocks of approximately the same relative density are bonded together. The test blocks shall be knife-planed to ensure the bonding faces are flat, smooth and parallel to the surface where pressure will be applied. No 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 6344-2:1998 is recommended). Remove any dust carefully. Do not touch or soil the prepared surfaces. They shall be free from dirt, dust or other contamination. Unless otherwise agreed between the interested parties, the thickness of each of the blocks shall not vary by more than 0,1 mm to ensure homogenous pressure during cure. Ensure that the angle between the growth rings and the surface to be bonded is between 30° and 70° (see Figure B.1).

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.

Where no manufacturer's instructions are available, the following processing conditions may be used:

— adhesive applied on both sides;

— adhesive spread: (150 ± 10) g/m²;

— open assembly time: (120 ± 10) s;

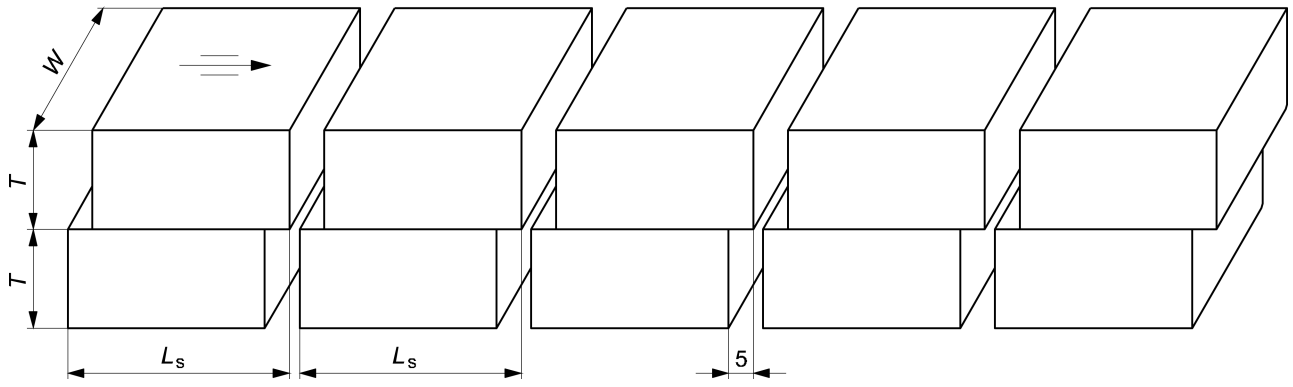
— closed assembly time: (180 ± 10) s;

— bonding pressure: (depending on the wood) (0,6 to 1,0) N/mm²);

— pressing time: 2 h.

Bond the panels with the pressure uniformly distributed over the bonded surface.

Dimensions in millimetres



Key

⟶	= direction of the grain
L_S	= overall length of the specimen (L + 5 mm + 5 mm)
W	= width of the bonding area (50 mm)
T	= thickness of the block

Figure 2 — Method of cutting test specimens from bonded blocks