
**Adhesives — Adhesives for bonding
parquet to subfloor — Test methods
and minimum requirements**

*Adhésifs — Adhésifs pour le collage de parquet au sol — Méthodes
d'essai et exigences minimales*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

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The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

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Adhesives — Adhesives for bonding parquet to subfloor — Test methods and minimum requirements

SAFETY STATEMENT — Persons using this document should be familiar with the normal laboratory practice. 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 International Standard specifies test methods for adhesives for bonding parquet and similar wood floorings to a subfloor. It also specifies the minimum requirements for shear strength, tensile strength to be achieved with these adhesives.

This International Standard does not refer to the selection and installation of parquet floorings.

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.

ISO 554, *Standard atmospheres for conditioning and/or testing* — Specifications

ISO 10365, *Adhesives — Designation of main failure patterns*

ISO 15605, *Adhesives — Sampling*

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

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

EN 1323, *Adhesives for tiles — Concrete slab for test*

EN 13488, *Wood flooring — Mosaic parquet elements*

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

hard adhesive

adhesive which shows a shear strength of 3,0 N/mm² or more

Note 1 to entry: Hard adhesives are tested according to 4.2.

3.2

hard elastic adhesive

adhesive which shows a shear strength of 2,0 N/mm² or more and a shear elongation of 0,5 or more

Note 1 to entry: Hard elastic adhesives are tested according to 4.4.

**3.3
elastic adhesive**

adhesive which shows a shear strength between 1,0 N/mm² and 2,0 N/mm² and a shear elongation of 1,0 or more

Note 1 to entry: Elastic adhesives are tested according to [4.4](#).

**3.4
shear elongation**

deformation of the unit thickness of an adhesive under a shear force

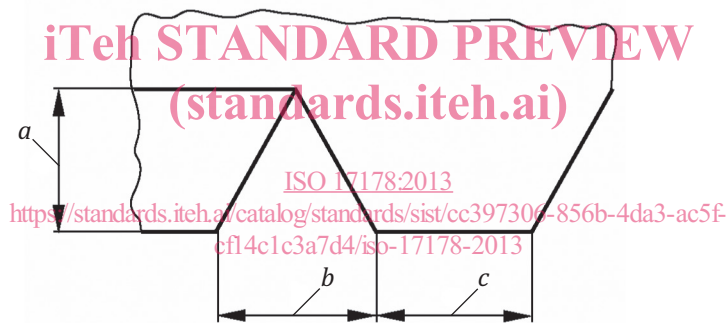
4 Test methods and procedures

4.1 Sampling and test conditions

Take the adhesive sample to be tested in accordance with ISO 15605 and examine and prepare it for testing in accordance with EN 1067.

All test methods shall be carried out under standard conditions at (23 ± 2) °C and at (50 ± 5) % relative air humidity in accordance with ISO 554. Condition all test materials for at least 24 h under standard conditions.

The shape of the notches shall be triangular for all notched trowels (see [Figure 1](#)).



- Key**
- a notch depth
 - b notch width
 - c notch distance

Figure 1 — Shape of notches of notched trowels

4.2 Test method for determining shear strength

4.2.1 Principle

Two mosaic parquet fingers are lap bonded and stored under two different conditions. After conditioning, the test specimens are clamped in a tensile testing machine and an increasing deformation is applied until breakage.

The shear strength is then calculated.

4.2.2 Material

4.2.2.1 Mosaic parquet finger according to EN 13488, oak with dimensions of (160 ± 5) mm × (23 ± 1) mm × (8,0 ± 0,3) mm.

4.2.2.2 Sample of adhesive, for testing.

4.2.3 Apparatus

4.2.3.1 Notched trowel (for the shape of the notch, see [Figure 1](#)), dimensions as follows:

- notch depth: $a = (3,25 \pm 0,10)$ mm;
- notch width: $b = (3,70 \pm 0,10)$ mm;
- notch distance: $c = (3,30 \pm 0,10)$ mm.

4.2.3.2 Weights, 2 kg \pm 10 g mass each.

4.2.3.3 Timer, accuracy 1 s.

4.2.3.4 Tensile testing machine, with a transverse rate of (20 ± 2) mm/min and a maximum force of 5 kN to 10 kN.

4.2.3.5 Oven, air circulating oven capable of controlling the temperature to within ± 2 °C.

4.2.4 Preparation of test specimens

With the trowel held vertically, spread the adhesive on one end of the mosaic parquet finger, so that an area of (800 ± 200) mm² is wetted. The ribs of the adhesive shall be nearly at right angles to the length of the mosaic parquet finger. Immediately, or after a waiting time as required by the adhesive manufacturer, form the single test specimen by pressing a second mosaic parquet finger on every prepared finger.

The overlap bond area shall be (600 ± 20) mm². The fingers shall be parallel. Every bond shall be loaded with a weight of 2 kg for 60 s.

Store two groups of test specimens free of tension as follows:

- a) 10 test specimens for 3 days at standard conditions 23/50 in accordance with ISO 554.
- b) 10 test specimens for a total of 28 days, in detail:
 - 1) seven days at standard conditions 23/50 in accordance with ISO 554;
 - 2) 20 days at (40 ± 2) °C;
 - 3) one day at standard conditions 23/50 in accordance with ISO 554.

4.2.5 Test procedure and evaluation of test results

After conditioning, clamp the ends of the test specimen in the jaws of the tensile testing machine. The lengths between the jaws shall be (200 ± 20) mm. Ensure that the force is applied centrally and in the plane of the bond. Load the test specimen until breakage. Determine the maximum force F_{\max} in N.

The shear strength T_S (in N/mm²) is calculated to an accuracy of $\pm 0,1$ N/mm² by Formula (1):

$$T_S = \frac{F_{\max}}{A} \quad (1)$$

where

F_{\max} is the maximum force, in N;

A is the bonded area, in mm².

4.3 Test method for the determination of tensile strength

4.3.1 Principle

Wood parquet pieces are bonded with an adhesive to a concrete slab. After storing under standard conditions for different time intervals, the tensile strength is determined using bonded pull head plates.

4.3.2 Material

4.3.2.1 **Sample of adhesive**, for testing.

4.3.2.2 **Parquet pieces** with dimensions of (50 ± 5) mm \times (50 ± 5) mm \times (approximately 10 mm).

4.3.2.3 **Concrete slab**, standard concrete slab in accordance with EN 1323.

4.3.2.4 **Adhesive** for bonding the pull head plates. <https://standards.iteh.ai/catalog/standards/sist/cc397306-856b-4da3-ac5f-cf14c1c3a7d4/iso-17178-2013>

4.3.3 Apparatus

4.3.3.1 **Notched trowel** (for the shape of the notch, see [Figure 1](#)), dimensions as follows:

- notch depth: $a = (3,25 \pm 0,10)$ mm;
- notch width: $b = (3,70 \pm 0,10)$ mm;
- notch distance: $c = (3,30 \pm 0,10)$ mm.

4.3.3.2 **Weights**, 2 kg \pm 10 g mass each.

4.3.3.3 **Pull head plates**, square metal plates with dimensions of (50 ± 1) mm \times (50 ± 1) mm and a minimum thickness of 10 mm with a suitable fitting for connecting them to the testing machine.

4.3.3.4 **Tensile testing machine**, with a suitable capacity and accuracy for the test. The machine shall be capable of applying the load to the pullhead plate at a rate of (250 ± 50) N/s through a suitable fitting that does not exert any bending force.

4.3.3.5 **Oven**, air circulating oven capable of controlling the temperature within ± 2 °C.

4.3.4 Preparation of test specimens

Pour about 300 g of the adhesive onto the concrete slab. Then, using the notched trowel held at an angle of approximately 60 ° to the slab, comb the adhesive to provide a uniform application. Hold the trowel at a right angle to one edge of the slab and draw it across the slab parallel to that edge in a straight line.

After a time recommended by the adhesive manufacturer, place at least 10 parquet pieces on the adhesive at a distance of approximately 50 mm apart and load each bonded parquet piece immediately with a weight of 2 kg for 60 s.

4.3.5 Test procedure

4.3.5.1 Determination of tensile strength after seven days

Prepare the test specimens in accordance with [4.3.4](#) and store them under standard conditions ([4.1](#)).

After six days, bond the pull head plates nearly flush to the parquet pieces with a suitably high strength adhesive (e.g. epoxide resin).

After a further 24 h storage under standard conditions ([4.1](#)), determine the tensile strength by applying a force at a constant rate of (250 ± 50) N/s until breakage.

Record the maximum force in N. Calculate the tensile strength according to [4.3.6](#).

4.3.5.2 Determination of tensile strength after 28 days

Prepare the test specimens in accordance with [4.3.4](#) and store them under standard conditions ([4.1](#)).

After 27 days, bond the pull head plates nearly flush to the parquet pieces with a suitably high strength adhesive (e.g. epoxide resin).

After a further 24 h storage under standard conditions ([4.1](#)), determine the tensile strength by applying a force at a constant rate of (250 ± 50) N/s until breakage.

Record the maximum force in N. Calculate the tensile strength according to [4.3.6](#).

4.3.5.3 Determination of tensile strength after heat ageing

Prepare the test specimens in accordance with [4.3.4](#).

Condition the test specimens under standard conditions ([4.1](#)) for seven days and place them in an air-circulating oven at (40 ± 2) °C for a further 20 days. Remove the test specimens from the oven and bond the pull head plates nearly flush to the parquet pieces with a suitable high strength adhesive (e.g. epoxide resin).

Condition the test specimens for a further 24 h under standard conditions ([4.1](#)). Then apply a force under constant rate of (250 ± 50) N/s until breakage. Record the maximum force in N. Calculate the tensile strength according to [4.3.6](#).