

Specifications for adhesives used for finger joints in non-structural lumber products

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National foreword

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Specifications for adhesives used for finger joints in non-structural lumber products

*Spécifications pour des adhésifs utilisés pour des aboutages dans des
produits en bois non structuraux*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 17087 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

Based with permission of ASTM, on ASTM D 5572, *Standard Specification for Adhesives Used for Finger Joints in Nonstructural Lumber Products*.

Specifications for adhesives used for finger joints in non-structural lumber products

1 Scope

This International Standard specifies performance levels for adhesives to be used in finger joints in nonstructural bonded lumber products. Such products include, but are not limited to, interior and exterior mouldings, window and door components or parts, and bonded lumber panels. Adhesives that meet the requirements of the various performance classes are considered capable of providing an adequate bond for use under the conditions described for the class. This specification is intended to be used to evaluate adhesives as well as the adhesive bonds in the finger joints.

2 Normative references

The following referenced documents are indispensable for the application of this International Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

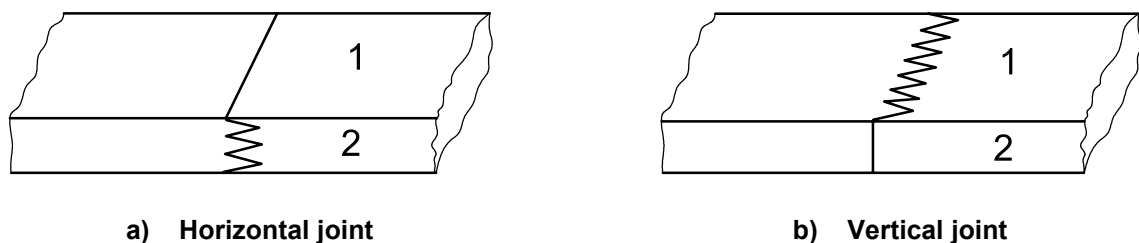
bond

union between materials produced using adhesives

3.2

finger joint

joint formed by bonding two precut members shaped like fingers (see Figure 1)



Key

- 1 face
- 2 edge

Figure 1 — Finger joint

3.3

dry-use nonstructural adhesive

adhesive capable of producing sufficient strength and durability to make the bonded lumber product serviceable in nonstructural use, under conditions in which the equilibrium moisture content (EMC) of the wood does not exceed 16 %

3.4

wet-use nonstructural adhesive

adhesive capable of producing sufficient strength and durability to make the bonded lumber product serviceable in nonstructural use, under conditions in which the EMC of the wood may be 16 % or greater

3.5

equilibrium moisture content

EMC

moisture content at which wood neither gains nor loses moisture to the surrounding air

NOTE Adapted from ASTM D 9.

3.6

moisture content

MC

amount of water contained in the wood, usually expressed as a percentage of the mass of the oven-dry wood

NOTE Adapted from ASTM D 9.

4 General principles

4.1 Adhesives are classified as dry-use or wet-use. Each classification includes consideration of short-term in-transit exposure conditions at elevated temperatures up to 104 °C.

NOTE This specification reflects results obtained with laboratory-made specimens compared to those obtained with industrially manufactured specimens. These finger joints were prepared using previously certified adhesives in cooperation with a manufacturer or equipment supplier who had the necessary finger joint cutter and assembly equipment. Such finger joints may vary in geometry and length from manufacturer to manufacturer, and this variation could affect the performance of the bonded finger joint assembly. Figure 2 depicts a typical finger joint configuration.

4.2 When changes are made in the design of industrially manufactured finger joints, the new design should preferably be compared to a control design that has been used successfully.

4.3 An industrially made finger joint assembly should preferably be evaluated using the requirements for compliance with this specification. When this specification is used to evaluate specimens made from laboratory-made assemblies, the results may not compare favourably with those obtained with specimens made from industrially made assemblies.

4.4 Test requirements are provided to determine if the adhesive is suitable for dry use or wet use.

4.5 The dry test and exposure conditions and treatments are to evaluate adhesives used in nonstructural finger joints for typical service conditions.

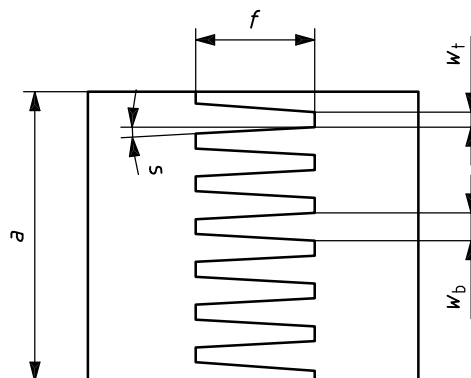
4.6 The 104 °C test is a more severe test designed to evaluate the product after exposure to short-term elevated-temperature conditions. This test is intended to simulate conditions that might be experienced in transit, during further processing or in service conditions.

NOTE Service conditions could typically include stress and time under stress, as well as elevated temperature.

4.7 Procedures are described in sufficient detail to permit duplication in different test laboratories.

To avoid potential problems that would be caused by interrupting the bonding process, the adhesive performance level should preferably be determined by the finger joint manufacturer prior to handling and early shipment.

Before beginning the full testing process, the test laboratory should preferably take a representative sample and check the dry strength first, in order to ensure that the product basically conforms to the dry-strength performance level certified by the adhesive manufacturer.



Key

a	height of joint	33 mm
f	length of finger	6 mm
w_t	width of finger tip	1 mm
w_b	width of finger base	2 mm
s	slope of finger	5°

NOTE The dimensions given are examples for a typical horizontal finger joint.

Figure 2 — Example of cross-section of finger joint test specimen

5 Apparatus and materials

5.1 Tensile-testing machine, capable of maintaining a pre-determined constant crosshead rate. The machine shall be capable of determining a maximum load. The measured strength shall be between 15 % and 85 % of the capacity of the machine. The machine shall permit the measurement and recording of the applied force with an uncertainty of ± 1 % or better.

The machine shall have a capacity of not less than 9 800 N in compression, shall be equipped for one-third-span, two-point loading for the flexure test as described in 9.1 and shown in Figure 3, shall be equipped with grips of sufficient length to hold the specimen firmly, preferably with a minimum length of 63 mm and minimum width of 19 mm, and shall be located in an atmosphere such that the moisture content of the specimen is not noticeably altered during testing.

The equipment shall be calibrated regularly in accordance with ISO 7500-1.

It is recommended that the machine be autographic, giving a chart that can be read in terms of millimetres of crosshead movement as one coordinate and applied force as the other coordinate. It is also recommended that inertialess equipment be used.

The finger joint specimens to be broken in tension are shorter than those to be broken in flexure. Accommodation shall be made in the equipment for handling the larger flexure specimen.

5.2 Environmental chamber, capable of conditioning specimens at $(23 \pm 2)^\circ\text{C}$ and $(65 \pm 5)\%$ relative humidity, having a capacity for at least 20 specimens well spaced and supported on racks to allow free air flow.