
**Timber structures — Bond performance
of adhesives —**

**Part 1:
Basic requirements**

*Structures en bois — Performance d'adhérence des adhésifs —
Partie 1: Exigences de base*



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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 20152-1 was prepared by Technical Committee ISO/TC 165, *Timber structures*.

ISO 20152 consists of the following parts, under the general title *Timber structures — Bond performance of adhesives*:

- *Part 1: Basic requirements*
- *Part 2: Additional requirements*

Introduction

ISO 20152 has been developed by ISO/TC 165 to provide performance requirements for adhesive bond lines formed in structural wood products. It is largely based on the Canadian Standards Association's CSA O112.9^[1] and CSA O112.10^[2]. These CSA-based tests for resistance to shear in the dry and wet states, resistance to delamination during exposure to wetting and drying, and resistance to creep static shear loading during exposure to high humidity, heat and combined heat and moisture are designated as Method A. An alternative "pathway" to the provisions has been provided by equivalent provisions of CEN (European Committee for Standardization) standards, designated as Method B. Both the CSA and CEN standards evaluate adhesive bonds against standardized wood species having tightly prescribed specific gravities.

ISO/TC 165 is nevertheless aware that North American and European species are not readily available in many other countries. Future revisions of ISO 20152 are expected to include evaluations of bond line performance made against other species having alternative specific gravities, provided evidence is produced to show that such evaluations produce equivalent results.

ISO 20152 consists of two parts: this part gives minimum requirements for adhesive bonds in all jurisdictions; ISO 20152-2 gives requirements that are specified by building regulatory authorities (high temperature performance at or above 180 °C) in other jurisdictions or for specific applications (gap-filling performance).

In the above-mentioned Canadian standards, normative reference is made to a number of other documents, which means that they (and a standard based on them) could not be used independently of those documents. Such references have been replaced wherever possible in this part of ISO 20152 without unduly lengthening the text. Because International Standards in the wood products area are not extensive, this has not been practicable in all instances, and normative reference to CEN and ASTM (American Society for Testing and Materials) standards has been retained. The ASTM references, for example, apply only to adhesive bond requirements that are less likely to be specified or are rather lengthy.

The Method A provisions for adhesives provide assessments based on using tightly specified hardwood and/or softwood substrates; the Method B provisions, on the other hand, are confined to the use of beech substrates. The tests and provisions herein represent only a first stage of adhesive evaluation when manufacturing an adhesively bonded structural wood product. It is anticipated that product standards will specify qualification procedures that verify the capacity of the adhesive to produce effective wood bonds, given the specific species and manufacturing processes involved. Within an international context, there are many variations in species and manufacturing practices that cannot be taken into account in an adhesive standard and thus case-by-case evaluations are essential.

Creep performance criteria and tests under elevated temperatures (180 °C) contained within CSA O112.9 have been removed. The matter was discussed within ISO/TC 165 and it was agreed that high temperature performance (greater than 180 °C) is not a requirement in all jurisdictions. A number of countries do not require the bond line itself to have a fire rating. Where a wood product (either protected or unprotected) is required to have a fire rating for specific classes of building construction, the view is taken that it is the structural assembly that must be evaluated by a national fire testing standard for assessment against national building code requirements.

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Timber structures — Bond performance of adhesives —

Part 1: Basic requirements

1 Scope

This part of ISO 20152 specifies the basic performance requirements for adhesives used to bond structural timber components. These requirements depend upon the service conditions according to Service Classes 1, 2 and 3, as defined herein.

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.

ISO 3130, *Wood — Determination of moisture content for physical and mechanical tests*

EN 301, *Adhesives, phenolic and aminoplastic, for load-bearing timber structures — Classification and performance requirements*

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

EN 302-2, *Adhesives for load-bearing timber structures — Test methods — Part 2: Determination of resistance to delamination*

EN 302-3, *Adhesives for load-bearing timber structures — Test methods — Part 3: Determination of the effect of acid damage to wood fibres by temperature and humidity cycling on the transverse tensile strength*

EN 15416-2, *Adhesives for load bearing timber structures other than phenolic and aminoplastic — Test methods — Part 2: Static load test of multiple bondline specimens in compression shear*

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

ASTM D1583, *Standard Test Method for Hydrogen Ion Concentration of Dry Adhesive Films*

ASTM D3535, *Standard Test Method for Resistance to Creep Under Static Loading for Structural Wood Laminating Adhesives Used Under Exterior Exposure Conditions*

ASTM D4300, *Standard Test Methods for Ability of Adhesive Films to Support or Resist the Growth of Fungi*