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Timber structures — Laminated veneer lumber — Structural properties

Structures en bois — Lamibois — Propriétés structurelles

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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 (see 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 (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 165, *Timber structures*.

This second edition cancels and replaces the first edition (ISO 22390:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the specimen dimension measurement accuracy in 4.3 and

— routine update of the standard.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Laminated veneer lumber (LVL) is being produced in many countries under different national standards and these products are being exported from one country to another. While the national standards have many similarities, there are also many areas of dissimilarity. Thus, there is a need for the development of this International Standard to establish consistency between these standards in order to ensure the suitability of LVL for structural end-use applications, regardless of the country of manufacture or end use. It is valuable for the industry, consumers, governments and distributors.

Timber structures — Laminated veneer lumber — Structural properties

1 Scope

This document specifies requirements for establishing the characteristic properties of structural laminated veneer lumber (LVL), including 5th percentile strength values, stiffness characteristics and other performance characteristics, related to its end use as a structural product for dry use (service class 1). It is applicable to members used in flatwise or edgewise bending orientations.

It does not cover the assessment of formaldehyde requirements, biological durability, fire performance or manufacturing, such as quality control and marking.

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.

ISO 10033-1, *Laminated Veneer Lumber (LVL) — Bonding quality — Part 1: Test methods*

ISO 10033-2, *Laminated Veneer Lumber (LVL) — Bonding quality — Part 2: Requirements*

ISO 13910, *Timber structures — Strength graded timber — Test methods for structural properties*

ISO 16572, *Timber structures — Wood-based panels — Test methods for structural properties*

ISO 16979, *Wood-based panels — Determination of moisture content*

EN 408, *Timber structures — Structural timber and glued laminated timber — Determination of some physical and mechanical properties*

ASTM D143, *Standard Test Methods for Small Clear Specimens of Timber*

ASTM D198, *Standard Test Methods of Static Tests of Lumber in Structural Sizes*

ASTM D4761, *Standard Test Methods for Mechanical Properties of Lumber and Wood-Base Structural Material*

ASTM D5456, *Standard Specification for Evaluation of Structural Composite Lumber Products*

ASTM D6815, *Standard Specification for Evaluation of Duration of Load and Creep Effects of Wood and Wood-Based Products*

NOTIFICATION NO MAFF 701 (Revised 2016), *Japanese Agricultural Standard for Laminated Veneer Lumber*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 http://www.electropedia.org/

3.1
laminated veneer lumber
LVL
composite of wood veneer sheet elements manufactured from one or more species, either separately or mixed, with wood fibres primarily oriented along the length of the member

Note 1 to entry: This does not exclude laminated veneer lumber with cross-laminated veneers.

3.2
characteristic value for strength
estimate of the 5th percentile values based on a statistical distribution obtained from results of tests on the defined properties with the test duration between 60 s and 300 s

Note 1 to entry: The characteristic values used for 3.2 are an estimate of the 5th percentile value of the sample as determined from ISO 12122-1 and ISO 12122-4.

Note 2 to entry: The defined properties are in accordance with Clauses 5 and 6.

3.3
characteristic value for stiffness
estimate of the mean property from results of tests on the defined properties with the test duration between 60 s and 300 s

Note 1 to entry: The characteristic values used for 3.3 are an estimate of the mean value of the sample as determined from ISO 12122-1 and ISO 12122-4.

Note 2 to entry: The defined properties are in accordance with Clauses 5 and 6.

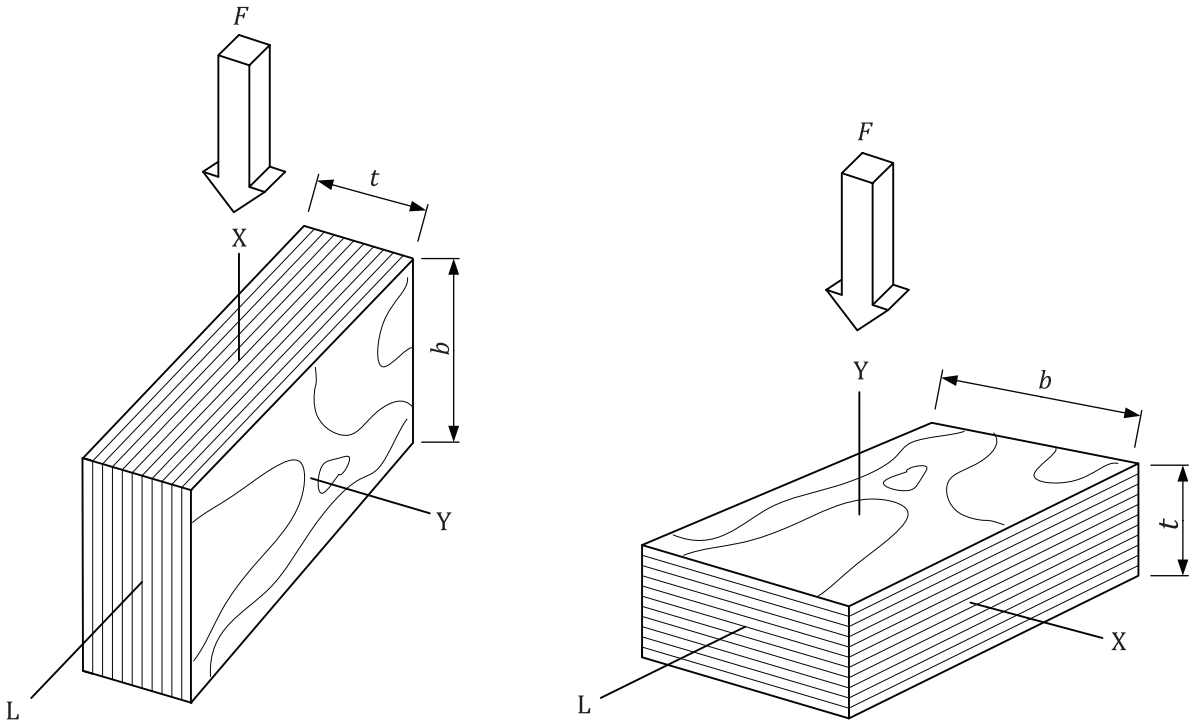
3.4
test specimen
specimen cut from random locations within the pieces of the LVL samples

3.5
thickness
t
dimension of a cross-section, which is perpendicular to the plane of the veneers, and measured in the Y-direction

Note 1 to entry: See Figure 1.

3.6
width
b
dimension of a cross-section, which is perpendicular to the thickness (or parallel to the plane of the veneers) and measured in the X-direction

Note 1 to entry: See Figure 1.



a) Cross-section related to edgewise (Joist) bending **b) Cross-section related to flatwise (Plank) bending**

Key

F applied load

t thickness of the LVL

b width of the LVL

Figure 1 — Cross-section of laminated veneer lumber

4 Requirements

4.1 Veneers

The minimum number of veneers in the cross-section shall be five. The maximum thickness of each veneer shall be 6 mm.

4.2 Bonding quality

The LVL shall utilize a structural adhesive suitable for dry service (service class 1) and the bonding quality and adhesive qualification shall be determined in accordance with ISO 10033-1 and ISO 10033-2.

NOTE 1 Attention is drawn to national standards which can be applicable.

NOTE 2 Examples of applicable national standards include EN 314-1, ASTM D5456 and MAFF Notification No. 701.

NOTE 3 Additional testing to cover more severe bonding service conditions (service classes 2 and 3) can be considered as a manufacturer's option and can be required by some national standards.