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Timber structures — Glued laminated timber — Component performance requirements

Structures en bois — Bois lamellé-collé — Performance des composants et exigences

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 165, *Timber structures*.

This second edition cancels and replaces the first edition (ISO 12578:2008), which has been technically revised.

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Introduction

Glued laminated timber is obtained by bonding together a number of laminations having their grain essentially parallel. In this way, a member with rectangular solid cross-section can be produced. Other non-rectangular shapes can also be produced.

The purpose of the requirements in this International Standard is to provide minimum performance requirements to ensure the in-service performance of the glued laminated timber. The requirements will need to be supplemented to take into consideration special conditions, materials or functional requirements.

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Timber structures — Glued laminated timber — Component performance requirements

1 Scope

This International Standard specifies requirements for the components of glued laminated timber members for structural use.

This International Standard is applicable to products with a finished lamination thickness of not more than 50 mm.

Although most glued laminated timber is made from coniferous species, this International Standard also applies to broad leaf species if the tests specified in this International Standard show that a satisfactory glue bond can be achieved.

The basic requirements apply to structural members of all service classes; however, special precautions are necessary for service class 3, for example, the use of weather resistant adhesives (see 5.3).

This International Standard does not apply to the determination of strength and stiffness characteristics. Annex B contains informative materials for formaldehyde emission.

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 9709, *Structural timber — Visual strength grading — Basic principles*

ISO 13912, *Structural timber — Machine strength grading — Basic principles*

ISO 10983:2014, *Timber — Finger joints — Minimum production requirements and testing methods*

ISO 8375:—[1)], *Timber structures — Glued laminated timber — Test methods for determination of physical and mechanical properties*

ISO 12579, *Timber structures — Glued laminated timber — Method of test for shear strength of glue lines*

ISO 12580, *Timber structures — Glued laminated timber — Methods of test for glue-line delamination*

ISO 20152-1, *Timber structures — Bond performance of adhesives — Part 1: Basic requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12579, ISO 12580, ISO 20152-1 and the following apply.

3.1
glued laminated timber
glulam
structural member formed by bonding together timber *laminations* (3.7) with their grain running essentially parallel to the member's longitudinal axis

1) To be published. (Revision of ISO 8375:2009)

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3.2
horizontal glulam
glued laminated timber (3.1) with the wide faces of the *laminations* (3.7) perpendicular to the direction of the larger cross-sectional dimension

Note 1 to entry: See Figure 1.

Note 2 to entry: This International Standard does not cover vertical glulam.

3.3
service class
group designation characterized by the moisture content of the members corresponding to the temperature and relative humidity of the surrounding air

3.3.1
service class 1
group designation characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air exceeding 65 % for a few weeks per year

Note 1 to entry: In service class 1, the average equilibrium moisture content of most softwoods does not exceed 12 %.

[SOURCE: ISO 20152-1:2010, 3.1]

3.3.2
service class 2
group designation characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air exceeding 85 % for a few weeks per year

Note 1 to entry: In service class 2, the average equilibrium moisture content of most softwoods does not exceed 20 %. Such conditions include resistance to the effects of moisture on structural performance due to construction delays or other conditions of similar severity.

[SOURCE: ISO 20152-1:2010, 3.2]

3.3.3
service class 3
group designation characterized by climatic conditions leading to moisture contents higher than *service class 2* (3.3.2), such as when a member is fully exposed to the weather

[SOURCE: ISO 20152-1:2010, 3.3]

3.4
maximum delamination percentage
maximum delamination length of one glue line in the test piece, measured on both end-grain surfaces of the test specimen multiplied by 100 and divided by the total length of glue lines on the two end-grain surfaces of each test piece for a single glue line in a test piece

Note 1 to entry: As defined in ISO 12580:2007, 8.3.

3.5
total delamination percentage
delamination length of all glue lines on the two end-grain surfaces in the test piece multiplied by 100 and divided by two times the length of one glue line

Note 1 to entry: As defined in ISO 12580:2007, 8.2.

3.6
wood failure percentage
percentage of the wood failure area in relation to the total sheared area

[SOURCE: ISO 12579:2007, 3.5]

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3.7
lamination
piece or pieces of timber of not more than 50 mm in thickness, with or without end joints forming part of a glulam member

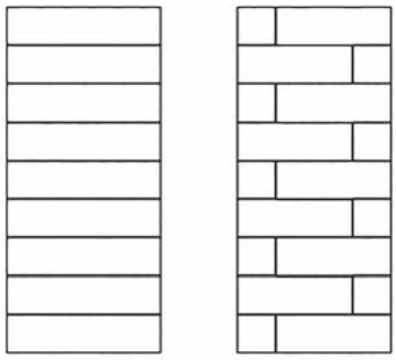


Figure 1 — Glue lines in cross-sections showing the normal position of the glue lines

3.8
declared strengths
<values or properties> mean strength, $\bar{f}_{x,dc}$, and characteristic strength, $f_{x,dc,k}$, of end joints strengths chosen by the manufacturer and used as a basis for determining compliance with the end joint strength requirements of this International Standard

Note 1 to entry: All values can be either bending (m) or tension (t) strength depending on which method of compliance testing is chosen.

Note 2 to entry: For established production facilities, the declared strengths may be determined using historical data and appropriate statistical methods.

3.9
qualification
process of assessing, through physical testing and statistical processing of test data, if the output from a combination of tools, materials and people engaged in producing glued laminated timber products meets the requirements of this International Standard

4 Symbols

$\bar{f}_x$	mean end joint strength determined by qualification testing and statistical processing (mPa)
$f_{x,k}$	characteristic end joint strength determined by qualification tests and statistical processing (mPa)
$\bar{f}_{x,dc}$	required mean strength of the end joints (mPa)
f_v	shear strength (mPa)
x	subscript indicating bending (m) or tension (t)
dc	declared properties

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