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**Timber structures — Bending  
applications of I-beams —**

**Part 2:  
Component performance and  
manufacturing requirements**

**iTeh STANDARD PREVIEW**  
*Structures en bois — Résistance à la flexion des poutres en I —  
Partie 2: Performances des composants et exigences de production*  
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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](http://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](http://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](http://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 22389-2:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

- The update of dimensional tolerances in [5.2](#).

A list of all parts in the ISO 22389 series can be found on the ISO website.

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](http://www.iso.org/members.html).

## Introduction

Prefabricated wood-based I-beams are being produced in many different 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 an International Standard to establish consistency among these national standards to ensure the suitability of prefabricated wood-based I-beams for end use applications, regardless of the country of manufacture or of end use. This document will be of benefit to industry, consumers, governments and distributors.

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# Timber structures — Bending applications of I-beams —

## Part 2:

# Component performance and manufacturing requirements

## 1 Scope

This document specifies the component performance and manufacturing requirements for prefabricated wood-based I-beams used as structural members in bending applications. It does not cover fire performance, formaldehyde requirements and biological durability.

This document gives requirements for manufacturing, in-house quality assurance and periodic re-evaluation of prefabricated wood-based I-beams.

Wood-based I-beams tested according to this document are intended for use in covered conditions and utilizing components that are able to resist the effects of moisture on structural performance due to construction delays or other conditions of similar severity, but not permanently exposed to the weather.

NOTE The service conditions are similar to “Service class 2” as defined in ISO 20152-1.

Testing, evaluation and performance characterization requirements for prefabricated wood-based I-beams are covered in ISO 22389-1.

This document does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

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

ISO 22389-1:2010, *Timber structures — Bending strength of I-beams — Part 1: Testing, evaluation and characterization*

ISO 22390, *Timber structures — Laminated veneer lumber — Structural properties*

EN 789, *Timber structures — Test methods — Determination of mechanical properties of wood based panels*

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

## 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 prefabricated wood-based I-beam**  
structural member manufactured using sawn or *structural composite lumber* (3.2) flanges and structural panel webs, forming an “I” cross-sectional shape, bonded together with a structural wood adhesive that possesses the moisture resistance suitable for the conditions specified

Note 1 to entry: These members are primarily used as joists in floor and roof construction.

Note 2 to entry: The service conditions are similar to “Service class 2” as defined in ISO 20152-1.

[SOURCE: ISO 22389-1:2010, 3.1, modified — The original NOTE 2 has been removed; new Note 2 to entry has been added.]

**3.2 structural composite lumber**  
composite of wood elements bonded with a structural wood adhesive that possesses the moisture resistance suitable for the conditions specified and intended for structural use in dry service conditions

Note 1 to entry: The service conditions are similar to “Service class 2” as defined in ISO 20152-1.

Note 2 to entry: Examples of wood elements include wood strands, strips, veneer sheets or a combination thereof.

[SOURCE: ISO 22389-1:2010, 3.3, modified — Note 1 to entry has been added; the original NOTE 2 has been removed; the original NOTE 1 has been changed to Note 2 to entry.]

## 4 Component requirements **ITeH STANDARD PREVIEW** (standards.iteh.ai)

**4.1 Flange stock**  
When the flange material is structural composite lumber, the following properties shall be determined in accordance with ISO 22390, ASTM D5456 or EN 789: modulus of elasticity, tension parallel to grain and compression parallel and perpendicular to grain. End joints in flange stock are permitted provided the joints conform to the general requirements of this document and ISO 22389-1:2010, 5.8.

**4.2 Web material**  
Web materials covered by this document shall be able to resist the effects of moisture on structural performance due to construction delays or other conditions of similar severity.

NOTE The service conditions are similar to “Service class 2” as defined in ISO 20152-1.

**4.3 Adhesives**  
Adhesives used to fabricate components as well as the finished products shall conform to ISO 20152-1.

## 5 Manufacturing requirements

**5.1 General**  
Wood-based I-beams shall be manufactured with components and adhesives that support the properties of the I-beams that are evaluated in accordance with ISO 22389-1.

**5.2 Dimensional tolerances**  
The tolerances permitted at the time of manufacture shall be as follows.

a) **Flange width:** ±3,0 mm



- b) **Flange thickness:**  $\pm 3,0$  mm.
- c) **I-beam depth:**  $+0$  mm or  $-3,5$  mm.

NOTE 1 The  $+0$  mm tolerance for the I-beam depth is intended to prevent a direct bearing from the floor loads above onto the I-beam ends, which can cause lateral instability of the I-beam. The floor loads above at the I-beam ends are typically designed to be carried by squash blocks or rim boards.

NOTE 2 When the structural properties such as "I" are calculated for the cross-section, the lower end of the tolerance range for all dimensions can be used.

## 6 In-house quality assurance

### 6.1 Manufacturing standard

#### 6.1.1 General

A manufacturing standard shall be written and maintained for each product and each production facility and shall be the basis for the quality assurance at that location. As a minimum, it shall include the following:

- a) material specifications, including incoming material inspection and acceptance requirements, and specifications for regrading flange stock, when applicable;
- b) process controls for each operation in the production of the product;
- c) quality control, inspection and testing procedures and frequencies;
- d) finished product identification, handling, protection and shipping requirements;
- e) when applicable, the minimum permitted flange end joint spacing.

#### 6.1.2 Inspection personnel

All in-house persons responsible for quality control shall demonstrate that they have adequate knowledge of the manufacturing process, of the inspection and test procedures used to control the process, of the operation and calibration of the recording and test equipment used and of the maintenance and interpretation of quality control records.

#### 6.1.3 Record keeping

All pertinent records shall be maintained on a current basis and be available for review. As a minimum, such records shall include:

- a) all inspection reports and records of test equipment calibration,
- b) all test data, including retests and data associated with rejected production, and
- c) details of any corrective actions taken and the disposition of any rejected production, resulting from tests or inspections.

#### 6.1.4 Testing equipment

Testing equipment shall be properly maintained, calibrated and evaluated for accuracy and adequacy.