
**Bamboo structures — Determination
of physical and mechanical properties
of bamboo culms — Test methods**

*Structures en bambou — Détermination des propriétés physiques et
mécaniques des tiges de bambou — Méthodes d'essais*



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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Contents

Page

Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	3
5 General requirements	4
5.1 Temperature and humidity	4
5.2 Rate of load application	4
5.3 Calibration	4
5.4 Test report	4
6 Sampling and storage of specimens	5
6.1 Sampling	5
6.2 Selection	6
6.3 Felling, marking and sample preparation	6
6.4 Despatch	6
6.5 Receipt and storage of the bamboo culms	6
6.6 Marking and conversion into test specimens	6
7 Moisture content	7
7.1 Moisture content by oven-dry method	7
7.1.1 Apparatus	7
7.1.2 Preparation of test pieces	7
7.1.3 Procedure	7
7.1.4 Calculation and expression of results	7
7.2 Moisture content by electrical moisture meter method	7
7.2.1 General	7
7.2.2 Apparatus	8
7.2.3 Procedure	8
7.2.4 Calculation and expression of results	8
7.2.5 Test report	8
8 Density	8
8.1 General	8
8.2 Apparatus	8
8.3 Preparation of test pieces	9
8.4 Procedure	9
8.5 Calculations and expressions of results	9
8.6 Test report	10
9 Mass per unit length	10
9.1 General	10
9.2 Apparatus	10
9.3 Preparation of test pieces	10
9.4 Procedure	10
9.5 Calculations and expressions of results	10
10 Compression strength and stiffness parallel to the fibres	11
10.1 Apparatus	11
10.2 Preparation of test specimens	12
10.3 Procedure	12
10.4 Calculation and expression of results	13
10.5 Test report	13
11 Tension strength and stiffness parallel to the fibres	13
11.1 Apparatus	13

11.2	Preparation of test specimens	13
11.3	Procedure	14
11.4	Calculation and expression of results.....	15
11.5	Test report.....	15
12	Bending strength and stiffness parallel to the fibres	15
12.1	General.....	15
12.2	Apparatus.....	15
12.3	Preparation of test culms.....	16
12.4	Procedure	16
12.5	Calculation and expression of results.....	17
12.6	Test report.....	17
13	Shear strength parallel to fibres	18
13.1	Apparatus.....	18
13.2	Preparation of test specimens	18
13.3	Procedure	19
13.4	Calculation and expression of results.....	19
13.5	Test report.....	19
14	Tension strength perpendicular to the fibres	19
14.1	Apparatus.....	19
14.2	Preparation of tests specimens.....	20
14.3	Procedure	20
14.4	Calculation and expression of results.....	21
14.5	Test report.....	21
15	Bending strength and stiffness perpendicular to the fibres	21
15.1	General.....	21
15.2	Apparatus.....	21
15.3	Preparation of test culms.....	22
15.4	Procedure	22
15.5	Calculation and expression of results.....	23
Bibliography	25

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).

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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*.

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.

This first edition cancels and replaces ISO 22157-1:2004.

Bamboo structures — Determination of physical and mechanical properties of bamboo culms — Test methods

1 Scope

This document specifies test procedures for specimens obtained from round bamboo culms. The data obtained from the test methods can be used to establish characteristic physical or mechanical properties to be used in structural engineering design or for other scientific purposes. This document provides methods for evaluating the following physical and strength properties: moisture content, density, mass per unit length; strength properties parallel to the fibre direction, compression, tension and bending, and strength properties perpendicular to the fibre direction, tension and bending. It also provides methods to estimate moduli of elasticity in bending, compression and tension parallel to fibres, and bending perpendicular to fibres.

The test methods reported in this document are intended for commercial testing applications. The test methods reported in this document are intended for commercial testing applications and can also be adopted as benchmark methods for scientific research.

This document is organized to provide requirements for standard tests to be carried out to determine the material properties of full-culm bamboo as a structural material.

2 Normative references

There are no normative references in this document.

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

bamboo culm

single shoot of bamboo comprised of the entire unaltered bamboo cross-section, which is usually a hollow cylinder except at *nodes* (3.11)

3.2

bamboo clump clump

cluster of bamboo shoots emanating from two or more rhizomes at the same location

3.3

cross-sectional area

A

area of the net section perpendicular to the direction of the longitudinal axis of the culm

3.4

equilibrium moisture content

moisture content (3.10) at which bamboo is neither gaining moisture from, nor losing moisture to, the environment