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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 47153-2026

**Test methods for physical and mechanical properties of
bamboo culms**

圆竹物理力学性能试验方法
(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is modified to adopt ISO 22157:2019 "Test methods for determination of physical and mechanical properties of bamboo structure round bamboo".

This document has undergone significant structural adjustments compared to ISO 22157:2019. A table comparing the structural numbering changes between the two documents is provided.

See Appendix A.

The technical differences between this document and ISO 22157:2019, and the reasons therefor, are as follows.

---The scope has been changed to conform to the requirements for drafting and using standards in my country (see Chapter 1, Chapter 1 of ISO 22157:2019);

---The normative references GB/T 36394 and GB/T 8170 have been added to adapt to my country's technical conditions (see Chapter 3 and Chapter 15);

---The terms and definitions have been updated to include linear density, circumferential strength, and circumferential modulus as defined in GB/T 36394, while terms such as bamboo thickets and flat bamboo have been removed.

The parameters included moisture content, fiber content, fiber saturation point, green material, internodes, moisture content, bamboo nodes, and accompanying samples. The parameters of round bamboo, outer diameter, wall thickness, and transverse direction were also modified.

The cross-sectional area is determined to meet the physical and mechanical property testing requirements of round bamboo in my country (see Chapter 3).

---Methods for measuring the inner diameter, outer diameter, and wall thickness of round bamboo specimens have been added to standardize sampling and dimensional measurement (see Chapter 5);

---The units for density and linear density have been changed to conform to the conventions for expressing test results in my country (see 7.5, 8.5, ISO 22157:2019).

8.5, 9.5);

---The schematic diagrams for the parallel-grain compressive strength and parallel-grain tensile strength tests have been modified to suit Chinese testing practices (see Figures 1 and 4).

Figures 1 and 4 of ISO 22157:2019);

---Added a schematic diagram of the saddle in the bending test device [see Figure 3b)];

---Equations (11) and (13) have been modified, and equation (12) has been added to adapt to the Chinese conventions for expressing test results [see 11.4, ISO 22157.

Equations (12) to (14) of 2019, Chapter 4;

---Equations (19) and (22) have been modified [see 14.5, Equations (20) and (22) of ISO 22157:2019];

---The requirement for the ratio of the specimen's outer diameter to its wall thickness has been added to the circumferential strength and circumferential elastic modulus calculations to meet the constraints of the calculations (see...).

14.3);

---Changes were made to the accuracy requirements for instruments and testing, improving operability (see Chapters 6-14, ISO 22157:2019).

Chapters 7 through 15);

---Changes were made to the moisture content, density, compressive strength and modulus of elasticity parallel to the grain, tensile strength and modulus of elasticity parallel to the grain.

Test steps for flexural strength and flexural modulus of elasticity, shear strength parallel to the grain, tensile strength across the grain, circumferential strength and circumferential modulus of elasticity to improve operability and adapt to Chinese testing practices (see Chapters 6, 7, 9-14, ISO 22157.

(Chapters 7, 8, and 10-15 from 2019)

---The test results for linear density have been added, and the format of the test results has been changed to conform to the Chinese expression habits (see Chapter 6-).

Chapter 14).

The following editorial changes have been made to this document.

---The standard name has been changed to "Test Methods for Physical and Mechanical Properties of Round Bamboo".

Please note that some content in this document may involve patents. The issuing

organization of this document assumes no responsibility for identifying patents.

This document was proposed by the National Forestry and Grassland Administration.

This document is under the jurisdiction of the National Bamboo and Rattan Standardization Technical Committee (SAC/TC263).

1 Scope

This document defines the terminology and definitions for the physical and mechanical property testing of round bamboo, and specifies the basic requirements and sampling methods for such testing.

The document describes the sample preservation, test result recording and reporting format, and specifies the moisture content, density, linear density, and compressive strength parallel to the grain of round bamboo.

Modulus of elasticity, tensile strength parallel to the grain and tensile modulus of elasticity parallel to the grain, flexural strength and flexural modulus of elasticity, shear strength parallel to the grain, tensile strength across the grain Test methods for physical and mechanical properties such as strength, circumferential strength and circumferential elastic modulus.

This document applies to the physical and mechanical property testing of round bamboo in the fields of construction, decoration, home furnishing and other engineering.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 8170 Rules for rounding off numerical values and the representation and determination of limiting values GB/T 36394 Bamboo Product Terminology

3 Terms and Definitions

The terms and definitions defined in GB/T 36394 and the following terms and definitions apply to this document.

round bamboo

Bamboo materials that retain the original cylindrical structure of bamboo.