

ICS 79.040
CCS B 67



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

GB/T 15780-2026

Replacing GB/T 15780-1995

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

竹材物理力学性质试验方法

Issued on: February 27, 2026

Implemented on: September 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
4	Sample Collection
4.1	Selection of Sample Bamboo
4.2	Sampling
5	Samples
5.1	Sample Preparation and Preservation
5.3	Calculation of Sample Quantity
6.1	Moisture content
6.1.3	Instruments and Equipment
6.1.4	Test Procedure
6.1.5	Result Calculation
6.2	Shrinkage rate and shrinkage coefficient
6.2.3	Instruments and Equipment
6.2.4	Test Procedure
6.2.5	Result Calculation
6.3	Density
6.3.3	Instruments and Equipment
6.3.4	Test Procedure
6.3.5	Result Calculation
6.4	Parallel compressive strength
6.4.3	Instruments and Equipment
6.4.4	Test Procedure
6.4.5	Result Calculation
6.5	Bending strength
6.5.3	Instruments and Equipment
6.5.3.3	Dial indicator. with an accuracy of
6.5.4	Test Procedure

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 15780-1995 "Test Methods for Physical and Mechanical Properties of Bamboo". Compared with GB/T 15780-1995, except for the structure... Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- Added terms and definitions (see Chapter 3);
- The bamboo sample selection has been changed (see 4.1, 2.1 of the.1995 edition);
- Sample preparation and preservation have been modified (see 5.1, 3.1 of the.1995 edition);
- The sample testing environment has been changed (see 5.2, 3.3 of the.1995 edition);
- The rounding requirement for calculating test results has been removed (see 3.5.4 in the.1995 edition);
- The test equipment has been removed (see Chapter 4 of the.1995 edition);
- Added instruments and equipment (see 6.1.3, 6.2.3, 6.3.3, 6.4.3, 6.5.3, 6.7.3, 6.8.3);
- Added the sample volume measurement method using the sample displacement method (see 6.3.4);

1 Scope

GB/T 15780-2026 is the Chinese national standard covering testing bamboo as a structural material - the density and moisture, the compression, bending and shear strength along and across the fibres, and the sampling that has to account for the variation along a culm. It replaces GB/T 15780-1995, a standard thirty-one years old, from before engineered bamboo became a construction material. In force since 1 September 2026. It was issued on 27 February 2026 and has been in force since 1 September 2026, replacing GB/T 15780-1995. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document defines the terms and definitions related to the physical and mechanical properties of bamboo, and describes the moisture content, shrinkage rate, and shrinkage coefficient of bamboo. Density, compressive strength parallel to the grain, flexural strength, flexural modulus of elasticity, tensile strength parallel to the grain, tensile modulus of elasticity parallel to the grain, shear strength parallel to the grain, etc. The test methods for physical and mechanical properties specify the format for recording and reporting test results. This document applies to the testing of the physical and mechanical properties of

bamboo.

4.1 Selection of Sample Bamboo

4.1.1 The selection of sample bamboo should be representative, reflecting the population represented by the test results, and conforming to the objectives of the experimental plan. For any For specific types of bamboo, select according to the following requirements.

a) To obtain the basic properties of a particular bamboo species, test materials should be collected from representative bamboo-producing areas. For widely distributed bamboo species, the following should be followed. Collect samples from different regions based on varying climates, geographical locations, soil conditions, and other natural factors.

b) In the bamboo forest of the collection area, select representative, mature bamboo samples from no fewer than 100 bamboo plants with a diameter at breast height of 50mm or more. There should be no fewer than 15 mature, defect-free sample bamboo plants.

c) Before felling the bamboo, mark the north direction above breast height.

4.1.2 After felling the sample bamboo, record the diameter at breast height (DBH), height below the branch, and bamboo height. For each bamboo, cut a section approximately 2.0m long upwards from a node about 1.5m above the ground. A section was cut off at a whole node to serve as test material. For bamboo species with lower branch height and smaller diameter at breast height, the section could be cut upwards from a whole node approximately 1.0m above the ground. Take a section of bamboo about 2.0m long and cut it off at the joint to use as the test material. The test material should be clearly numbered.

4.1.3 After the bamboo samples are harvested, they should be transported in a timely manner to prevent discoloration, cracking, rotting, and insect infestation.

4.2 Sampling

4.2.1 From each bamboo segment approximately 2m long, select two bamboo segments without obvious defects or damage to the bamboo shoots, with an internode length of over.200mm. Tube. The lower section of the bamboo tube is split into one 15mm wide strip and one 30mm wide strip in the east, south, west and north directions, respectively, as shown in Figure 1. 15mm wide bamboo strips are used to prepare samples for testing shrinkage, density, bending strength, and bending modulus of elasticity. 30mm wide bamboo strips are used for... Prepare samples for compression and shearing along the grain. Using the top section of bamboo, split it into 15mm wide sections in the east, south, west, and north directions, as shown in Figure 2. One bamboo strip each, for making parallel tensile test specimens.

4.2.2 Test sections for preparing shrinkage test specimens should be soaked in room temperature water until their dimensions are basically stable before specimen preparation.

Other splitting methods... After drying, the test strips should be air-dried indoors, with the bamboo pith facing down. The top layer should be weighed down with a heavy object to prevent the test strips from warping or deforming. The unit is millimeters. Figure

1.Method for preparing split test strips for shrinkage, density, flexural strength, compressive strength, and shear strength along the grain. Figure

2.Method for preparing tensile test strips along the grain.

5.1 Sample Preparation and Preservation

5.1.1 Bamboo segments shall be cut according to the test requirements, and the bamboo segments shall be free from obvious defects and damage. Unless otherwise specified in the test method, the samples shall not have any defects. Defects. Each sample should be clearly labeled.

5.1.2 Specimen preparation accuracy. Unless otherwise specified in the test methods, the permissible error for specimen length is $\pm$

1.0 mm, and the permissible error for width is... The difference is $\pm 0.5\text{mm}$, but the relative deviation of the width over the entire length of the sample should not exceed 0.2mm.

5.1.3 The processed sample should be placed in a constant temperature and humidity environment at $(20\pm 2)^{\circ}\text{C}$ and $(65\pm 5)\%$ to achieve humidity equilibration. The difference between two weighing results 24 hours apart should not exceed 0.1% of the mass of the last weighing of the sample.

5.2 Sample Testing Environment The test environment for the samples should be maintained at a temperature of $(20\pm 2)^{\circ}\text{C}$ and a relative humidity of $(65\pm 5)\%$. If the environmental conditions do not meet the test requirements, [further action may be taken]. Furthermore, the sample after the moisture content has been adjusted should be stored in a sealed container and only taken out during the test.

5.3 Calculation of Sample Quantity

5.3.1 The number of test specimens can be calculated according to the formula specified for the results of various physical and mechanical properties.

5.3.2 When processing test results, the relevant statistics should be calculated according to the following formulas.

5.3.3 To approximate the minimum number of samples required for the experiment, the average coefficient of variation of the following main properties of bamboo can be used, as shown in Table 1. As shown.

6.1 Moisture content