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

GB/T 1927.21-2022

Replacing GB/T 14018-2009

**Test methods for physical and mechanical properties of small
clear wood specimens - Part 21: Determination of nail and
screw holding power**

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Table of Contents

foreword

Introduction

1 Scope

2 Normative references

3 Terms and Definitions

4 principles

foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document is part 21 of GB/T 1927 "Test methods for physical and mechanical properties of wood with small unblemished specimens". GB/T 1927 has issued

Published the following sections.

- Part 1. Collection of test materials;
- Part 2. Sampling methods and general requirements;
- Part 3. Determination of growth ring width and latewood rate;
- Part 4. Determination of moisture content;
- Part 5. Determination of density;
- Part 6. Determination of drying shrinkage;
- Part 7. Determination of water absorption;
- Part 8. Determination of swelling property;
- Part 9. Determination of flexural strength;
- Part 10. Determination of flexural modulus of elasticity;
- Part 11. Determination of compressive strength along the grain;
- Part 12. Determination of transverse grain compressive strength;
- Part 13. Determination of the compressive modulus of elasticity of the transverse grain;

- Part 14.Determination of tensile strength along the grain;
- Part 15.Determination of transverse grain tensile strength;
- Part 16.Determination of shear strength along the grain;
- Part 17.Determination of impact toughness;
- Part 18.Determination of impact indentation resistance;
- Part 19.Determination of hardness;
- Part 20.Determination of splitting force;
- Part 21.Determination of nail holding force.

This document replaces GB/T 14018-2009 "Test method for wood nail holding force".
Compared with GB/T 14018-2009, except for structural adjustment

In addition to editorial changes, the main technical changes are as follows.

- Added terms and definitions (see Chapter 3);
- Added "or screwed in" (see Chapter 4);
- Changed "Figure 1 Schematic diagram of accessories for nail holding force test" (see Figure 1, Figure 1 of the.2009 edition);
- Added "Screws are ordinary carbon structural steel nails with a nail length of 40 mm and a nail shank diameter of 4 mm according to the provisions of GB/T 100" (see 6.2.1);
- Change "nail" to "steel nail" (see 7.1, 6.2 of the.2009 edition);
- Increased the nail holding force test steps for screws [see 7.1b)];
- Increased the determination of the air-dry density of wood samples (see 7.5);
- Added the arithmetic mean value of the two measurement results of each surface as the specification of the nail holding force, and the difference between the two measurement values is too large
processing regulations (see 8.2);
- Changed the nature of Appendix A (see Appendix A, Appendix A of the.2009 edition).

This document is modified to adopt ISO 9087.1998 "Determination of the fixing force of nails and screws under axial load of timber".

Compared with ISO 9087.1998, this document has made the following structural adjustments.

- The chapter "Terms and Definitions" has been added;

--- Chapter 4 corresponds to Chapter 3 in ISO 9087.1998;

---Chapter 5 corresponds to Chapter 4 in ISO 9087.1998, where 5.3 corresponds to 4.3 and 4.4 in ISO 9087.1998, and 5.4 corresponds to

Should be 4.5 in ISO 9087.1998;

---Chapter 6 corresponds to Chapter 5 in ISO 9087.1998, where 6.1 corresponds to 5.1 and 5.3 in ISO 9087.1998, and 6.2 corresponds to

Should be 5.2 and 5.4 in ISO 9087.1998;

---Chapter 7 corresponds to Chapter 6 in ISO 9087.1998, of which 7.1 and 7.2 correspond to 6.1 in ISO 9087.1998;

--- Chapters 8 and 9 respectively correspond to Chapters 7 and 8 in ISO 9087.1998, which adds 9.1.

The technical differences between this document and ISO 9087.1998 and their reasons are as follows.

a) Added normative references to LY/T 1788 (see Chapter 3) to ensure the professionalism and uniformity of terms;

b) Added the schematic diagram of the attachment of the nail holding force test (see 5.2), which is helpful for understanding the test equipment and samples;

c) The normative references YB/T 5002 and GB/T 100 are added, and the specifications and types of screws and nails used in the test are stipulated.

(see 6.2.1), which is beneficial to the nail holding force test;

d) Added the requirement to pre-drill pilot holes at the corresponding positions of the test for harder wood (see 7.1), which is conducive to the specification of harder wood

Nail grip test;

e) The requirement for the test report to record the nature and quantity of the nails or screws tested (see 9.2) is deleted, because the nails or screws in this document

The characteristics of screws have uniform standards.

The following editorial changes have been made to this document.

a) Change the name of the standard to "Test methods for physical and mechanical properties of wood with small flawless samples - Part 21.Determination of nail holding force";

b) Added the expressions of "along grain", "radial" and "chord direction" in the sample size;

c) The symbols of the nail-holding force and maximum load of the sample in formula (1)

have been changed;

d) Added Appendix A (informative) "Record Form of Wood Nail Holding Force Test".

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

The standard of test methods for physical and mechanical properties of wood is used in wood scientific research, teaching, wood inspection, wood structure design, wood processing and production, etc.

It is widely used and is an important basic standard in the wood industry. In 1980, my country released the first edition of the national test method for the physical and mechanical properties of wood.

National standards (GB/T 1927~GB/T 1943), revised in 1991 and 2009 respectively. In recent years, with the development of wood science and technology

Development, the International Organization for Standardization (ISO) on ISO 3129.2012 "Sampling methods for physical and mechanical tests on wood with small flawless specimens and general

"Requirements" has been revised, and ISO 3130.1975 "Determination of moisture content in wood physical and mechanical tests", ISO 3131.1975 "Wood physics

15 international standards for test methods including "Mechanical Test Density Determination" have been integrated and revised. Based on this, in order to be in line with international standards, this

The national standard for testing methods of physical and mechanical properties of wood was revised for the third time, and the 22 scattered test methods were integrated and adjusted into

The sub-parts of GB/T 1927 adopted the latest version of the international standard in the revision.

GB/T 1927 aims to establish a test method for the physical and mechanical properties of small unblemished wood samples, and is intended to consist of 21 parts.

--- Part 1. Collection of test materials. The purpose of this paper is to describe the method of sample collection for carrying out tests on the physical and mechanical properties of wood with small flawless specimens.

--- Part 2. Sampling methods and general requirements. The purpose is to establish a method suitable for carrying out testing of physical and mechanical properties of wood with small flawless samples.