INTERNATIONAL STANDARD

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Physical and mechanical properties of wood — Test methods for small clear wood specimens —

Part 1: Determination of moisture content for physical and mechanical tests

Propriétés physiques et mécaniques du bois — Méthodes d'essais sur échantillons de bois sans défauts —

Partie 1: Détermination de la teneur en humidité en vue des essais physiques et mécaniques

Reference number
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Foreword

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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. www.iso.org/directives

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 218, *Timber*.

This first edition of ISO 13061-1 cancels and replaces ISO 3130:1975, which has been technically revised by specifying various levels of precision of measurements and allowing larger sizes of test pieces.

ISO 13061 consists of the following parts, under the general title *Physical and mechanical properties of wood — Test methods for small clear wood specimens*:

— Part 1: *Determination of moisture content for physical and mechanical tests*

— Part 2: *Determination of density for physical and mechanical tests*

— Part 3: *Determination of ultimate strength in static bending*

— Part 4: *Determination of modulus of elasticity in static bending*

— Part 6: *Determination of ultimate tensile stress parallel to grain*

— Part 7: *Determination of ultimate tensile stress perpendicular to grain*

The following parts are under preparation:

— Part 5: *Determination of strength in compression perpendicular to grain*

— Part 10: *Determination of impact bending strength*

— Part 11: *Determination of resistance to impact*

— Part 12: *Determination of static hardness*

— Part 13: *Determination of radial and tangential shrinkage*

— Part 14: *Determination of volumetric shrinkage*

— Part 15: *Determination of radial and tangential swelling*

— Part 16: *Determination of volumetric swelling*

— Part 17: *Determination of ultimate stress in compression parallel to grain*

Introduction

The main purpose of ISO 13061 is to establish test methods for small clear wood specimens, and general requirements for determining physical and mechanical properties of wood.

Physical and mechanical properties of wood — Test methods for small clear wood specimens —

Part 1: Determination of moisture content for physical and mechanical tests

1 Scope

This part of ISO 13061 specifies oven-drying methods for determining the moisture content of wood for physical and mechanical tests on small clear wood specimens.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3129, *Wood — Sampling methods and general requirements for physical and mechanical testing of small clear wood specimens*

ISO 24294, *Timber — Round and sawn timber — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24294 and the following apply.

3.1
moisture content
amount of moisture contained in wood, expressed as a percentage of its oven-dry mass

4 Principle

Moisture content is one of the most important variables affecting the physical and mechanical properties of wood. The procedures described in this part of ISO 13061 are designed for obtaining the values of moisture content consistent with the needs of the user at different levels of precision (see 5.1).

Moisture content is determined by weighing the test piece before and after drying to a constant mass. The moisture content is calculated as the loss in mass as a percentage of the mass of the test piece after drying.

NOTE The moisture content of wood is expressed as a percentage of oven-dry mass of the test piece (oven-dry basis); thus the moisture content values may exceed 100 %.

5 Apparatus

5.1 Balance - Based on a 10-g oven-dry mass of test piece, minimum readability of the balance shall be determined by the desired reporting level of precision:

Reporting precision level, *W*, %	**Minimum balance readability,** mg
1,0	100
0,5	50
0,1	10
0,05	5
0,01	1

For other oven-dry mass levels, the precision requirement shall be scaled appropriately.

5.2 Oven - A forced convection oven that can be maintained at a temperature of (103 ± 2) °C throughout the drying chamber for the time required to dry the specimen to the endpoint, shall be used. The oven shall be vented to allow the evaporated moisture to escape.

5.3 Desiccator – A vapour-tight container with absorbent material (e.g. silica gel, calcium chloride, etc.), to maintain the air dry.

6 Preparation of test pieces

6.1 The sampling and preparation of test pieces shall be in accordance with ISO 3129.

6.2 Test pieces shall have a cross-section of at least 20 mm by 20 mm and minimum length along the grain of 20 mm and be made preferably in the form of rectangular prism.

6.3 To determine moisture content of test pieces made for other physical or mechanical tests and/or to determine the relationship between moisture content and other properties of wood, the test pieces made for other tests or samples cut from them shall be used. The form, dimensions and method of taking samples depend on the form and dimensions of the pieces. At least one sample per test piece shall be taken near the point of interest (e.g. in the vicinity of the failure zone in destructive tests).

6.4 After preparation, the test pieces shall be stored under conditions ensuring that their moisture content remains unchanged before testing.

7 Procedure

7.1 Weigh the test piece to the level of precision selected according to 5.1.

7.2 Dry the test piece to constant mass at a temperature of (103 ± 2) °C.

NOTE Constant mass is considered to be reached when the results of two successive weighing operations, carried at a minimum interval of 8 h, do not differ by more than 0,2 % of the mass of the test pieces.

7.3 Test pieces for wood species containing volatile organic substances (resins, gums, etc.) in quantities exceeding the error of the determination shall be vacuum-dried.

7.4 After cooling down the test piece in a desiccator, weigh it as soon as possible to minimize moisture uptake. The weighing shall be carried out to the level of precision selected according to 5.1. For high levels of precision, the requirement in 7.5 shall be observed.

7.5 If it is necessary to determine the moisture content with a precision of 0,1 % or higher, weighing shall be carried out using closed weighing jars.

8 Calculation and expression of results

8.1 The moisture content, W, of each test piece shall be calculated to the required level of precision using the following formula:

$$W,\% = \frac{m_1 - m_2}{m_2} \times 100 \quad (1)$$

where

m_1 is the initial mass of the test piece before drying, in g; and

m_2 is the oven-dry mass of the test piece, in g.

8.2 When the weighing is carried out using jars according to 7.5, the following formula shall be used:

$$W,\% = \frac{m_1 - m_2}{m_2 - m_0} \times 100 \quad (2)$$

where

m_0 is the mass of the jar, in g;

m_1 is the mass of the jar containing the test piece before drying, in g; and

m_2 is the mass of the jar containing the test piece after drying, in g.

8.3 The mean and standard deviation of the results obtained for the individual test pieces in a sample shall be calculated to the required level of precision.

9 Test report

The test report shall include the following information:

a) a reference to this part of ISO 13061 (i.e. ISO 13061-1:2014);

b) sampling details in accordance with ISO 3129;

c) the results of the test and their statistical values, calculated as specified in Clause 8;

d) the date of the test;

e) the name of the organization performing the test.