SLOVENSKI STANDARD
oSIST prEN ISO 12571:2021

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Higrotermalno obnašanje gradbenih materialov in proizvodov - Ugotavljanje higroskopnosti (ISO/DIS 12571:2020)

Hygrothermal performance of building materials and products - Determination of hygroscopic sorption properties (ISO/DIS 12571:2020)

Wärme- und feuchtetechnisches Verhalten von Baustoffen und Bauprodukten - Bestimmung der hygroskopischen Sorptionseigenschaften (ISO/DIS 12571:2020)

Performance hygrothermique des matériaux et produits pour le bâtiment - Détermination des propriétés de sorption hygroscopique (ISO/DIS 12571:2020)

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91.100.01	Gradbeni materiali na splošno	Construction materials in general
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Hygrothermal performance of building materials and products — Determination of hygroscopic sorption properties

Performance hygrothermique des matériaux et produits pour le bâtiment — Détermination des propriétés de sorption hygroscopique

ICS: 91.100.01

IMPORTANT — Please use this updated version dated 2020-10-27, and discard any previous version of this DIS. Table A.1 has been corrected.

This document is circulated as received from the committee secretariat.

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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 (see www.iso.org/directives).

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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 *163*, *Thermal performance and energy use in the built environment* Subcommittee SC 1, *Test and measurement methods*.

This third edition cancels and replaces the second edition (ISO 12571:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Revision of Table A.1

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.

Introduction

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Hygrothermal performance of building materials and products — Determination of hygroscopic sorption properties

1 Scope

This International Standard specifies two alternative methods for determining hygroscopic sorption properties of porous building materials and products:

a) using desiccators and weighing cups (desiccator method);

b) using a climatic chamber (climatic chamber method).

The desiccator method is the reference method.

This International Standard does not specify the method for sampling.

The methods specified in this International Standard can be used to determine the moisture content of a sample in equilibrium with air at a specific temperature and humidity.

2 Normative references

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

ISO 9346, *Hygrothermal performance of buildings and building materials — Physical quantities for mass transfer — Vocabulary*

ISO 12570, *Hygrothermal performance of building materials and products — Determination of moisture content by drying at elevated temperature*

3 Terms and definitions, symbols and units

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9346 and the following apply.

3.1.1
equilibrium moisture content
moisture content of a porous material in equilibrium with the environment and the relative humidity of the ambient air, at a specified temperature

3.1.2
moisture content mass by mass
mass of evaporable water divided by mass of dry material

3.1.3
moisture content volume by volume
volume of evaporable water divided by volume of dry material

3.1.4
moisture content mass by volume
mass of evaporable water divided by volume of dry material

Note 1 to entry: The mass of water is determined by weighing the specimen before and after drying at the appropriate drying temperature until constant mass is reached.

3.1.5
sorption curve
curve established at a series of increasing equilibrium relative humidities at a given temperature

3.1.6
desorption curve
curve established at a series of decreasing equilibrium relative humidities at a given temperature

3.2 Symbols and units

Symbol	Quantity	Unit
m	mass of test specimen	kg
m_0	mass of dried test specimen	kg
u	moisture content mass by mass	kg/kg
ψ	moisture content volume by volume	m^3/m^3
w	moisture content mass by volume	kg/m^3

4 Principle

4.1 Sorption curve

The specimen is dried to constant mass. While maintaining a constant temperature, the specimen is placed consecutively in a series of test environments, with relative humidity increasing in stages. The moisture content is determined when equilibrium with each environment is reached. Equilibrium with the environment is established by weighing the specimen until constant mass is reached. A minimum of four test atmospheres shall be selected in the humidity range under consideration.

After establishing the moisture content at each relative humidity the sorption curve can be drawn.

4.2 Desorption curve

The starting point for desorption is a relative humidity of at least 95 %. This might be the last point of the sorption curve or might be reached by sorption from a dried test specimen. While maintaining a constant temperature, the specimen is placed consecutively in a series of test environments, with relative humidity decreasing in stages. The moisture content is determined when equilibrium with each environment is reached. Equilibrium with the environment is established by weighing the specimen until constant mass is reached. A minimum of four test atmospheres shall be selected in the humidity range under consideration. Finally, the specimen is dried to constant mass.

After establishing the moisture content at each relative humidity the desorption curve can be drawn.

NOTE A defined starting point for desorption has been chosen for better reproducibility.

5 Apparatus

5.1 Desiccator method

The test apparatus shall include:

a) **weighing cups** which do not absorb water and with tight-fitting lids;

b) **balance**, capable of weighing to an accuracy of ± 0,01 % of the mass of the test specimen;

NOTE If larger weighing cups are used, the weighing accuracy can be determined with respect to the total mass and the required accuracy of the test results.

c) **drying oven**, in accordance with ISO 12570;

d) **desiccator**, capable of maintaining the relative humidity within ± 2 % relative humidity;

e) **constant-temperature chamber**, capable of maintaining the specified test temperature to an accuracy of ± 0,5 K.

5.2 Climatic chamber method

The test apparatus shall include:

a) **weighing cups** which do not absorb water;

b) **balance**, capable of weighing to an accuracy of ± 0,01 % of the mass of the test specimen;

NOTE If larger weighing cups are used, the weighing accuracy can be determined with respect to the total mass and the required accuracy of the test results.

c) **drying oven**, in accordance with ISO 12570;

d) **climatic chamber**, capable of maintaining the relative humidity within ± 5 % relative humidity and the temperature within ± 2 K over the whole test area.

6 Test specimens

6.1 Specification of the test specimens

A test specimen shall be representative of the product and have a mass of at least 10 g. Specimens of materials with a dry density less than 300 kg/m^3 shall have an area of at least 100 mm × 100 mm. If it can be demonstrated from other references that the result will not be affected, a test specimen can be cut or crushed into smaller pieces to reduce the time to reach equilibrium with the environment.

6.2 Number of test specimens

A minimum of three specimens shall be tested. The procedure in Clause 7 shall be applied to each specimen.

7 Procedure

7.1 Test conditions

Reference sorption curves shall be established at a temperature of (23 ± 0,5) °C or (27 ± 0,5) °C in tropical countries. If agreed between the parties, sorption curves can be established at other temperatures for specific applications.