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

*Performance hygrothermique des matériaux et produits pour le bâtiment —
Détermination du taux d'humidité par séchage à chaud*

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12570 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 163, *Thermal insulation*, Subcommittee SC 1, *Test and measurement methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Annex A of this International Standard is for information only.

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Foreword

The text of EN ISO 12570:2000 has been prepared by Technical Committee CEN/TC 89 "Thermal performance of buildings and building components", the secretariat of which is held by SIS, in collaboration with Technical Committee ISO/TC 163 "Thermal insulation".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by December 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This standard is one of a series of standards which specify test methods for the thermal and moisture related properties of building materials and products.

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Introduction

The moisture content of a material can be used for various purposes, such as

- part of a test method for the moisture related behaviour of the material;
- to characterize the material's state;
- to compare the actual moisture content with a critical or safe moisture content or to assess the moisture distribution.

The test specimens, number, size and preparation can be specified in the relevant product standards for the different types of materials.

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1 Scope

This standard, which is applicable to porous water permeable materials, specifies a general method for determining the free water content of building materials by drying at elevated temperature. The standard does not specify the method for sampling.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN ISO 9346 Thermal insulation - Mass transfer - Physical quantities and definitions (ISO 9346)

3 Definitions, symbols and units

3.1 Definitions

For the purposes of this standard, the definitions given in EN ISO 9346 and the following apply.

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3.1.1 moisture content mass by mass

mass of evaporable water divided by mass of dry material

3.1.2 moisture content volume by volume

volume of evaporable water divided by volume of dry material

3.1.3 moisture content mass by volume

mass of evaporable water divided by volume of dry material

3.1.4 dry density

mass per volume of dry material

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
V	volume of test specimen	m^3
ψ	moisture content volume by volume	m^3/m^3
w	moisture content mass by volume	kg/m^3
ρ_0	dry density	kg/m^3

4 Principle

The moisture content is calculated from the mass of the test specimen before drying and the mass after drying at elevated temperature.

5 Apparatus

The test apparatus shall include:

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a) ventilated oven capable of maintaining the drying temperature with accuracy specified in table 1 and a relative humidity of less than 10 %: in warm, humid climates or at low drying temperatures it can be necessary to provide a supply of dried air to achieve this relative humidity;

b) scale or balance capable of weighing test specimens with an uncertainty not greater than 0,1 % of their mass;

c) metal rule or metal tape graduated in millimetres and permitting reading to an accuracy of 0,5 mm;

d) callipers, or any other instrument, capable of reading the dimensions of test specimens to an accuracy of 0,1 mm;

e) desiccator.

6 Test specimens

6.1 Dimensions and number of test specimens

The dimensions and number of test specimens, chosen to be representative of the material, shall be specified.

NOTE These can be found in the relevant product standard or any other applicable document or agreement.

6.2 Preparation of test specimens

6.2.1 When test specimens have to be taken from larger elements, cutting and drilling shall not significantly influence the moisture content.

6.2.2 If the moisture content mass by volume, w , or volume by volume, ψ , is to be determined, the test specimen surfaces shall be clean and sufficiently plane to enable determination of the volume to the accuracy specified in 7.2 or 7.3 as relevant.

6.2.3 If the sampling is done in the field or when the drying cannot follow immediately after the cutting of the test specimens, the test specimens shall be packed in vapour-tight metal containers or wrapped in two layers of low permeability film or foil of vapour resistance at least 200 MNs/g or s_d at least 1000 m (e.g. polyethylene foil of minimum thickness 0,2 mm) and sealed in order to avoid any change in moisture content before drying. When sampling in rain or after immersion, dry the surface of the specimen with a wrung out damp sponge.

Care shall be taken to mark the sample to ensure subsequent identification.

7 Procedure

7.1 Test conditions

The laboratory temperature during the test shall be $(23 \pm 6) ^\circ\text{C}$.

7.2 Procedure for test specimens weighed immediately after cutting from sample

Before drying, weigh the test specimens with an accuracy of 0,1 % of their mass. If the determination of the moisture content mass by volume or volume by volume is required, measure the dimensions of the test specimen with a metal rule or a calliper, with the accuracy stated in clause 5. The error in determining the volume of the test specimen shall not exceed 1 %.

Dry the specimens at the temperature specified in the relevant product standard to constant mass. If no temperature for drying is specified in any product standard, the value appropriate to the material type specified in table 1 shall be used.