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Hygrothermal performance of building materials and products — Determination of moisture adsorption/desorption properties in response to periodic temperature variation

Performance hygrothermique des matériaux et produits pour le bâtiment — Détermination des propriétés d'adsorption/désorption de l'humidité en réponse à une fluctuation périodique de la température

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Foreword

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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*.

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.

Hygrothermal performance of building materials and products — Determination of moisture adsorption/desorption properties in response to periodic temperature variation

1 Scope

This document specifies the test method of moisture-adsorption/desorption efficiency (or capacity) of building materials, when there are changes in temperature in sealed boxes containing building materials.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
moisture-adsorption/desorption amount
amount of moisture which is adsorbed in or desorbed from materials in a moisture-adsorption/desorption process, calculated as:

$$m = m_4 \cdot V / A$$

$$m_4 = (\Sigma|v - \bar{v}|)/(\Sigma|\theta - \bar{\theta}|)$$

4 Specimen

A specimen shall be extracted from the test product. The size, the thickness, and the number of sheets shall be as follows.

a) Size: the standard size of the specimen shall be 100 mm x 100 mm.

b) Thickness: the thickness shall, as a rule, be the thickness of the product. However, the upper limit of thickness is 20 mm.

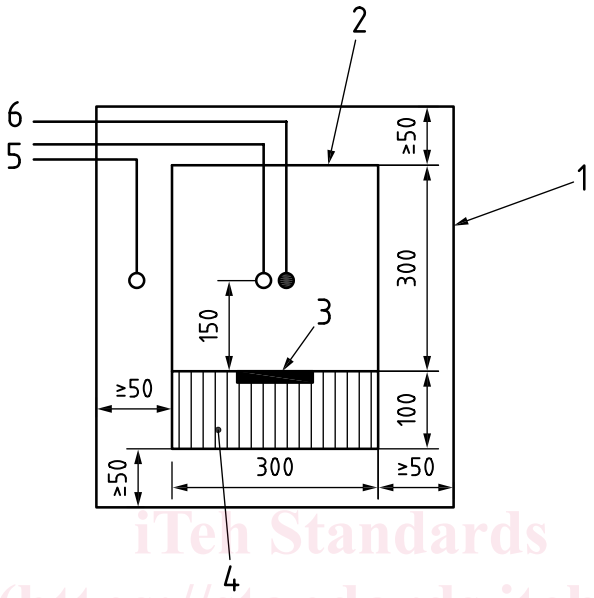
c) The number of sheets: the number of sheets shall, as a rule, be one for each test condition.

5 Test apparatus

5.1 General

A test apparatus shall be principally comprised of a sealed box, a box or chamber with thermostat, a thermometer and a hygrometer, and be constructed as given in Figure 1.

Dimension in millimetres



Key

1 chamber
2 sealed box
3 specimen
4 thermal insulation
5 thermometer
6 hygrometer

Figure 1 — Apparatus

5.2 Sealed box

A sealed box shall have dimensions as given in Figure 2 when dimensions of the specimen are 100 mm x 100 mm, and shall be comprised of a container for storing a specimen, the packing for keeping airtightness, and shall conform to the following:

a) The material of a container and a cover shall be non-hygroscopic and non-permeable.

b) The volume of the container shall conform to the following conditions:

$$V / A = 2{,}7\ \mathrm{m}^3 \cdot \mathrm{m}^{-2}$$

where

V is the volume of space in the sealed box (m^3);

A is the moisture-adsorption/desorption area of the specimen (m^2).