



SLOVENSKI STANDARD

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Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje lastnosti pri prehodu zračne pare

Thermal insulating products for building applications - Determination of water vapour transmission properties

Wärmedämmstoffe für das Bauwesen - Bestimmung der Wasserdampfdurchlässigkeit

Produits isolants thermiques destinés aux applications du bâtiment - Détermination des propriétés de transmission de la vapeur d'eau

Ta slovenski standard je istoveten z: FprEN 12086

ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
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FINAL DRAFT
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English Version

**Thermal insulating products for building applications -
Determination of water vapour transmission properties**

Produits isolants thermiques destinés aux applications du
bâtiment - Détermination des propriétés de transmission de
la vapeur d'eau

Wärmedämmstoffe für das Bauwesen - Bestimmung der
Wasserdampfdurchlässigkeit

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 88.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (FprEN 12086:2012) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 12086:1997.

The revision of this standard contains no major changes only minor corrections and clarifications of editorial nature.

This European Standard is one of a series of standards which specify test methods for determining dimensions and properties of thermal insulating materials and products. It supports a series of product standards for thermal insulating materials and products which derive from the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (Directive 89/106/EEC) through the consideration of the essential requirements.

This European Standard has been drafted for applications in buildings but it may also be used in other areas where it is relevant.

This EN test standard is one of the following group of inter-related standards on test methods for determining dimensions and properties of thermal insulation materials and products, all of which come within the scope of CEN/TC 88:

EN 822, *Thermal insulating products for building applications — Determination of length and width*

EN 823, *Thermal insulating products for building applications — Determination of thickness*

EN 824, *Thermal insulating products for building applications — Determination of squareness*

EN 825, *Thermal insulating products for building applications — Determination of flatness*

EN 826, *Thermal insulating products for building applications — Determination of compression behaviour*

EN 1602, *Thermal insulating products for building applications — Determination of the apparent density*

EN 1603, *Thermal insulating products for building applications — Determination of dimensional stability under constant normal laboratory conditions (23 °C/50 % relative humidity)*

EN 1604, *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*

EN 1605, *Thermal insulating products for building applications — Determination of deformation under specified compressive load and temperature conditions*

EN 1606, *Thermal insulating products for building applications — Determination of compressive creep*

EN 1607, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces*

EN 1608, *Thermal insulating products for building applications — Determination of tensile strength parallel to faces*

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EN 1609, *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*

EN 12085, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*

EN 12086, *Thermal insulating products for building applications — Determination of water vapour transmission properties*

EN 12087, *Thermal insulating products for building applications — Determination of long term water absorption by immersion*

EN 12088, *Thermal insulating products for building applications — Determination of long term water absorption by diffusion*

EN 12089, *Thermal insulating products for building applications — Determination of bending behaviour*

EN 12090, *Thermal insulating products for building applications — Determination of shear behaviour*

EN 12091, *Thermal insulating products for building applications — Determination of freeze-thaw resistance*

EN 12429, *Thermal insulating products for building applications — Conditioning to moisture equilibrium under specified temperature and humidity conditions*

EN 12430, *Thermal insulating products for building applications — Determination of behaviour under point load*

EN 12431, *Thermal insulating products for building applications — Determination of thickness for floating floor insulating products*

EN 13793, *Thermal insulating products for building applications — Determination of behaviour under cyclic loading*

EN 13820, *Thermal insulating products for building applications — Determination of organic content*

1 Scope

This European Standard specifies the equipment and procedures for determining the water vapour transmission rate, water vapour permeance and water vapour permeability of test specimens in the steady state under different sets of specified test conditions. It is applicable to thermal insulating products.

It is intended to be used for homogeneous materials (see note 1) and for products which may contain integral skins or facings of different material(s).

NOTE 1 A material is considered to be homogeneous, with regard to mass distribution, if its density is approximately the same throughout, i.e. if the measured density values are close to its mean density.

NOTE 2 This test method is not normally used for determining the water vapour transmission properties of single, separate vapour barriers (of high diffusion resistance), such as prefabricated films, foils, membranes or sheets, due to the long duration of the test. For products with a vapour retarder or barrier with a water vapour diffusion equivalent air layer thickness $s_d \geq 1\,000\text{ m}$ (see 3.6) other test methods e.g. IR-detection can be used for measuring the single separate vapour retarder or barrier, provided that the results obtained are in the same range as the values measured in accordance with this standard.

The water vapour transmission rate and permeance values are specific to the test specimen (i.e. the product) thickness tested. For homogeneous products, the water vapour permeability is a property of the material.

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.

EN 12085, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

water vapour transmission rate

g

quantity of water vapour transmitted through unit area in unit time under specified conditions of temperature, humidity and thickness

3.2

water vapour permeance

W

quotient of the water vapour transmission rate of the test specimen and the water vapour pressure difference between the two specimen faces during the test

3.3

water vapour resistance

Z

inverse of water vapour permeance

3.4

water vapour permeability

δ

product of the permeance and the thickness of the test specimen

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Note 1 to entry: The water vapour permeability of a homogeneous product is a property of the material. It is the quantity of water vapour transmitted per unit of time through a unit area of the product per unit of vapour pressure difference between its faces for a unit thickness.

3.5

water vapour diffusion resistance factor μ

quotient of the water vapour permeability of air and the water vapour permeability of the material or the homogeneous product concerned; it indicates the relative magnitude of the water vapour resistance of the product and that of an equally thick layer of stationary air at the same temperature

3.6

water vapour diffusion equivalent air layer thickness s_d

thickness of a motionless air layer which has the same water vapour resistance as the test specimen with the thickness d

Note 1 to entry: A conversion table and units for the above definitions are given in Annex A.

4 Principle

The test specimen is sealed to the open side of a test dish containing a desiccant or an aqueous saturated salt solution. The assembly is then placed in a test atmosphere whose temperature and humidity are controlled. Because of the difference between the partial water vapour pressures in the test assembly and in the test atmosphere water vapour flows through the test specimen. Periodic weighings of the assembly are made to determine the rate of water vapour transmission when the steady state is reached.

5 Apparatus

5.1 Test dishes, preferably of circular shape and which are (corrosion) resistant to any desiccant or to the salt solution which they may be required to contain and impermeable to water or water vapour. These dishes are typically made of glass or metal. The size of the dishes depends on the size of the test specimen to be tested. The difference in size between the upper exposed area (A_1) and the lower exposed area (A_2) of the test specimen shall be less than 3 % (see examples in Annex B).

NOTE Some types of test dish are unsuitable for use with certain materials. This should be stated in the relevant product standard or any other European technical specification.

5.2 Measuring instruments, capable of determining linear dimensions in accordance with EN 12085.

5.3 Template (with edge tapered to facilitate removal after use) with a shape and size corresponding to that of the test dish to duplicate the exposed area of the specimen. The template shall have an area that is at least 90 % of the test specimen's surface in order to limit the edge effect due to non-linear vapour flow (see Annex C).

5.4 Analytical balance, capable of weighing the test assembly to an accuracy of ± 1 mg or better. If larger test assemblies are used, the weighing accuracy may be determined with respect to the total weight and the required accuracy of the test results.

5.5 Chamber, capable of being maintained within ± 3 % of the required relative humidity and within ± 1 °C of the required temperature.

NOTE In order to maintain the required conditions throughout the chamber it may be necessary to use air circulation with an air speed of between 0,02 to 0,3 m/s.

If a non-injection type humidity chamber is used, saturated salt solutions may then be used.

5.6 Sealant, unaffected by test conditions. The following are examples of suitable sealants: