Goal and Opportunities

The water vapor transmission property of building materials is one of the most important parameters for assessing the moisture protection of building components. Especially the drying process of constructions is determined by the water vapor transmission property.

The diffusion resistance factor describes the water vapor diffusion resistance of the material in comparison to stagnant air at normal pressure. Hence, the diffusion resistance coefficient of air is 1, whereas its value for building materials is mostly considerably higher.

Homogenous construction materials are characterized by the water vapor diffusion resistance factor ($\mu$). For thin layers of building components the sd-value, which results from the product's $\mu$ multiplied with its thickness, is mostly more appropriate.

The sd-value is also titled as the diffusion equivalent air layer thickness factor.

Procedure

In the Federal Republic of Germany the procedure of measuring the water vapor diffusion properties are standardized by DIN EN ISO 12572. The standard distinguishes between “dry-cup-method”, for the humidity range from 0 to 50 RH%, and “wet-cup-method”, for the range from 50 to 100 RH%. The measurements are conducted under isothermal conditions.

A plane sheet of the tested material is put on a vessel as the top closure and sealed to the vessel’s rim. A constant relative humidity is controlled by using a desiccant or saturated salt solution. The vessels are held in a climate chamber, providing both constant temperature and relative humidity.
Water vapor is diffusing through the material specimen driven by the partial vapor pressure gradient between the air layers adjacent to the surfaces of the material. After the diffusion flux has reached a steady-state, a constant change in weight of the vessel per time unit can be noted. This corresponds to the steady-state diffusion flux.

**STANDARD**

**DIN EN ISO 12572**  
Hygrothermal performance of building materials and products  
Determination of water vapor transmission properties

**DIN EN 12086**  
Thermal insulating products for building applications  
Determination of water vapor transmission properties

**DIN EN ISO 7783-2**  
Paints and varnishes  
Determination of water vapor transmission properties - Cup method

**DIN EN 1931**  
Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing  
Determination of water vapor transmission properties

**DIN 53122-1**  
Testing of plastics and elastomer films, paper, board and other sheet materials  
Determination of water vapor transmission

**ASTM E 96-95**  
Standard Test Methods for Water Vapor

**SAMPLE SIZE**

**ROUND**

Diameter: 90 mm, 100 mm and 200 mm

**RECTANGULAR**

Length x Width:  
100 mm x 100 mm  
200 mm x 100 mm  
180 mm x 130 mm  
(nonstandard dimension possible)

Transmission of Materials

The accreditation extends to  
DIN EN ISO/IEC 17025:2005 for the Test Laboratory  
Moisture/Mortar/Radiation/Emissions