

EPS is just as vapour-permeable as wood

One characteristic of vapour-permeable building materials is that they offer little resistance to the transport of vapour molecules. Many people are surprised to learn that the water vapour diffusion resistance of EPS matches that of wood. Therefore, unlike some suggestions you may hear, it is not like living in a plastic bag! Removing moisture from rooms also requires an adequate rate of air change. This is done by means of conventional window ventilation (short intense airing) or controlled domestic ventilation (with heat recovery).

- At an assumed outdoor air temperature of 0 °C the quantity of moisture removed from a room amounts to 245.2 g/h, of which only 3.2 g/h is attributable to vapour diffusion through the exterior wall and a full 242 g/h to air change due to the opening of the windows!

Outdoor air temperature °C	The quantity of moisture removed from a room [g/h]	
	by steam diffusion through the exterior wall	by air change (once)
-20	5,5	436
-10	4,8	378
0	3,2	242
19	0,4	15

Source: *Industrieverband Hartschaum*

- The water vapour diffusion resistance value (symbol μ) expresses the factor by which the water vapour diffusion resistance of a building material is greater than a layer of air of the same thickness. The greater the μ -value, the vapour-tighter the construction material.

Examples for μ -values:

Air $\mu = 1$
 EPS $\mu = 50 - 60$
 Wood (spruce) $\mu \approx 54$
 Concrete $\mu = 50 - 100$
 Glass $\mu = 10.000$
 PE-foil (0,1 mm) $\mu = 65.000$

- In a properly constructed exterior wall there is almost no exchange of indoor and outdoor air. In this regard, walls made of materials like wood and brick are no different to walls made of concrete and steel.
- The widespread concept of “breathing walls” was refuted as long ago as 1928. The building physicist Erwin Raisch established that 50 times more air passes through a keyhole in an hour than through one square metre of exterior wall!