



Customer:

AS Uninaks

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10612 TALLINN

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Experimental Report N° 137/20

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- Assignment: Determination of water vapour permeability of lime mortar mix.
- Product designation: Dry mix, marked as „**Lime mortar NAKS LK 2, 06.01.20**”. Forwarded to the laboratory by customer on 08.01.2020 (25 kg).
- Test method: EN 1015 „Methods of test for mortar for masonry”. Part 19: Determination of water vapour permeability of hardened rendering and plastering mortars.

Fresh mortar was prepared at 14.01.2020 in accordance with EN 1015-2 using water quantity, specified by manufacturer $w = 0.23$. Mortar was mixed in mixer according to EVS-EN 196-1 and the following mixing procedure: mixing 1,5 min + maturing time 3 min + mixing 1 min. The flow value was determined in accordance with EN 1015-3 and it was 180 mm. For determination of water vapour permeability five circular test specimens with diameter of ~155 mm and thickness of ~10 mm were prepared by applying mortar to a substrate of autoclaved aerated concrete with a density of $(550 \pm 50) \text{ kg/m}^3$. Test specimens were cured at temperature $(20 \pm 2) \text{ }^\circ\text{C}$ 5 days at relative humidity $(95 \pm 5) \%$ and 23 days at relative humidity $(50 \pm 5) \%$. At the end of curing period on 12.02.20 the circular specimens were set in test cups with saturated solution of potassium nitrate (KNO_3) and the edges were sealed with sealant. Between the specimen and the surface of the solution was left an air gap $(10 \pm 5) \text{ mm}$. The exposed area of specimens – the arithmetic mean of the upper and lower free surface areas was $A = 0.019 \text{ m}^2$. The cups were stored at temperature $(20 \pm 2) \text{ }^\circ\text{C}$ and relative humidity $(50 \pm 5) \%$. The test cups were weighed periodically and the rate of water vapour transmission was determined, at the same time the temperature, relative humidity and barometric pressure were recorded. The weighings were stopped when three successive determinations of mass change per weighing interval i.e. the quantity of water vapour passing through the specimen per unit time for each test specimen was constant. For each set of successive weighings of the specimens the water vapour permeance Λ , water vapour permeability δ and water vapour permeability coefficient μ were calculated.

Test results:

No of test specimen	Thickness of specimen d, m	Water vapour permeance Λ , $\text{kg/m}^2 \cdot \text{s} \cdot \text{Pa}$		Water vapour permeability δ , $\text{kg/m} \cdot \text{s} \cdot \text{Pa}$		Water vapour permeability coefficient μ	
		individual	mean	individual	mean	individual	mean
Lime-cement mix	1	0,0101	$1,08 \cdot 10^{-9}$	$1,11 \cdot 10^{-11}$	$1,02 \cdot 10^{-11}$	17,8	19,4
	2	0,0107	$9,50 \cdot 10^{-10}$	$9,79 \cdot 10^{-12}$			
	3	0,0106	$9,89 \cdot 10^{-10}$	$1,02 \cdot 10^{-11}$			
	4	0,0105	$9,92 \cdot 10^{-10}$	$1,02 \cdot 10^{-11}$			
	5	0,0104	$9,48 \cdot 10^{-10}$	$9,76 \cdot 10^{-12}$			

The test results are valid to the described test sample only.

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