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(Bitte Az. bei jedem Schriftverkehr angeben)

### PRELIMINARY REMARKS

In a letter dated 25 June 2012, the ISFT-mARTH (Ingenieur- und Sachverständigenbüro für Bau- und Fußbodentechnologie) was requested by Dr. Olaf Janßen to test the Determination of water-vapor transmission properties – Cup method according to DIN EN ISO 7783:2012 of the CC-PU-Siegel and to set out the results obtained in the following

### Report

No. 23912

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After consulting with the client and received information, the product was mixed in a ratio of 10:1 according to manufacturer's instructions. The product was applied in double application with approx. 50 g/m<sup>2</sup> on glass frits (Ø 90 mm porosity 4, thickness 6 mm). The dryfilm thickness was calculated according 6.3.2 to the standard specification.

	Application rate	Dryfilm thickness
Glas frit 1	1,17 g*	45 µm
Glas frit 2	1,48 g*	59 µm
Glas frit 3	1,32 g*	53 µm

\* Due to the porosity of the Glas frits and the low product viscosity, the application of 50 g/m<sup>2</sup> was not possible. The application rate is therefore above this value.

The test pieces stored for 7 days at standard conditions (23/50).

### Determination of water-vapor transmission properties – Cup method according to DIN EN ISO 7783:2012\*

This International Standard specification specified a method for determining the water-vapor transmission properties of coatings of paints, varnishes and related products.

It describes a method for determining the water-vapor transmission rate of self-supporting and non-self-supporting coatings.

#### Test conditions:

Used method	:	dry-cup method
Temperature	:	23 °C
Conditioning	:	method B
Medium barometric pressure during the test	:	99620 Pa
Relative humidity on the coating-side	:	50 % rF
Relative humidity on the side turned away from the coating	:	93 % rF

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**Note:**

$A_s$	=	the area of the substrate through which the water vapor flows
$A_{cs}$	=	the area of the substrate plus test piece through which the water vapor flows
$G_s$	=	rate of flow of water vapor through the substrate
$G_{cs}$	=	rate of flow of water vapor through the substrate plus coating
$V_s$	=	water-vapor transmission rate of the substrate
$V_{cs}$	=	water-vapor transmission rate of the substrate plus coating
$V$	=	water-vapor transmission rate
$sd$	=	water-vapor diffusion-equivalent air layer thickness
$\delta_a$	=	water-vapor permeation coefficient of air, $0,0169 \frac{g}{m \times d \times Pa}$
$\Delta_{pv}$	=	difference between the partial water-vapor pressure in the test cup and that in the test enclosure (i. e. between the two sides of the coating)

**Results:**

<b>Zero sample</b>	<b><math>A_s</math></b>	<b><math>G_s</math></b>	<b><math>V_s</math></b>	<b><math>sd^{*1}</math></b>	<b><math>sd^{*2}</math></b>
<b>Glas frit</b>	<b>[<math>m^2</math>]</b>	<b>[<math>g/h</math>]</b>	<b>[<math>g/m^2 \times d</math>]</b>	<b>[<math>m</math>]</b>	<b>[<math>m</math>]</b>
<b>1</b>	0,006381	2,64	976,24	0,021	0,021
<b>2</b>	0,006376	2,70	999,21	0,020	0,020
<b>Average</b>	<b>0,006379</b>	<b>2,67</b>	<b>987,72</b>	<b>0,021</b>	<b>0,021</b>

<b>PU Siegel matt</b>	<b><math>A_{cs}</math></b>	<b><math>G_{cs}</math></b>	<b><math>V_{cs}</math></b>	<b><math>V</math></b>	<b><math>sd^{*1}</math></b>	<b><math>sd^{*2}</math></b>
<b>Glas frit</b>	<b>[<math>cm^2</math>]</b>	<b>[<math>g/h</math>]</b>	<b>[<math>g/m^2 \times d</math>]</b>	<b>[<math>g/m^2 \times d</math>]</b>	<b>[<math>m</math>]</b>	<b>[<math>m</math>]</b>
<b>1</b>	0,006373	2,23	825,66	5032,16	0,004	0,004
<b>2</b>	0,006373	1,87	692,37	2315,43	0,009	0,009
<b>3</b>	0,006369	2,66	985,49	435314,9	0,000	0,000
<b>Average</b>	<b>0,006372</b>	<b>2,25</b>	<b>834,51</b>	<b>147554,2</b>	<b>0,004</b>	<b>0,004</b>
<b>Average without 3</b>	<b>0,006379</b>	<b>2,05</b>	<b>759,02</b>	<b>3673,80</b>	<b>0,007</b>	<b>0,007</b>

\*<sup>1</sup> = calculated according equation (8) of ISO 7783,  $sd = \frac{\delta a \times \Delta_{pv}}{V}$

\*<sup>2</sup> = calculated according equation (9) of ISO 7783,  $sd = \frac{20,4}{V}$

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Concluding remark:

The water-vapor transmission rate of the product „PU Siegel matt“ exceeds

$$V = > 680 \frac{g}{m^2 \times d}.$$

„Scope“ according to the standard:

Water-vapor transmission rates of more than  $680 \text{ g}/(\text{m}^2 \times d)$  (i. e. water-vapor diffusion-equivalent air layer thickness,  $s_d$ , of less than 0,03 m) will not be accurately quantified by the test method described in this International Standard.

The Expert



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