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Deutscher Akkreditierungs Rat
DAR

Test report

P 6995-1

Testing order:	**Water vapour permeability of** **Rollbase P/V** **according to EN 1931**
Customer:	**INDEX S.p.A.** **Via Rossini, 22** **37060 Castel D'Azzano (Verona)** **Italy**
Persons in charge:	**Dipl.-Ing. N. Machill** **C. Preller**
Date of the test report:	**31.08.2011**
This test report comprises:	**6 pages** **1 enclosure**

C O N T E N T S

1 SUBJECT

Polymer Institut was charged by INDEX S.p.A., Castel D'Azzano/Italy, to carry out the water vapour permeability of the elastoplastic polymer-bitumen membrane

Rollbase P/V

according to EN 1931 *"Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of water vapour transmission properties".*

2 RECEIPT OF SAMPLES

The following samples were delivered to the Polymer Institut on 2011-01-13.

Table 1: Receipt of samples

no.	material	description	dimensions [cm]
1	Rollbase P/V	elastoplastic polymer-bitumen membrane	104 x 97 x 0,2

3 PREPARATION OF TEST SPECIMEN

The test specimens were punched out in the required dimension of ∅ 90 mm.

The layer thickness has been determined using a film thickness tester of the company Erichsen, Model 497. The results can be taken from table 2.

Three test specimens were arranged in steel cups containing water-free calcium chloride to produce a relative humidity of less than 1 % at 23 °C.

Another test specimen was sealed to an empty cup as reference.

The dishes were placed into a desiccator containing a sodium chloride solution to produce a relative humidity of 75 % at 23 °C.

The prepared test dishes were stored at these conditions for 90 days.

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4 TESTING OF WATER-VAPOUR TRANSMISSION PROPERTIES

4.1 Procedure

The water vapour permeability was determined according to EN 1931.

test atmosphere: 23°C / 75 % r.h.

The test dishes were weighed to the nearest 0,1 mg once a week until the change of mass was linear to the time (stationary condition).

4.2 Calculation

From the mass increase at the stationary condition the water-vapour transmission rate g [g/(m² x d)], the water-vapour diffusion-equivalent air layer thickness s_d in [m] and the water-vapour resistance factor μ [-] were determined as follows.

Water-vapour transmission rate g

The *water-vapour transmission rate g* is characterised by the mass of water vapour in [g] that is transmitted over 24 h through 1 m² of test specimen area under specified conditions (temperature, humidity gradient). It is calculated by the following equation:

$$g = \frac{\Delta m}{A * t}\left[\frac{g}{m^2 * d}\right] \qquad \textit{(equation 1)}$$

Where:

Δm	mass difference within the respective period of time [g]
A	area of the specimen [m²]
t	period of time [d]

Diffusion-equivalent air layer thickness s_d

The *diffusion-equivalent air layer thickness s_d* in [m] indicates the thickness of a stationary air layer that possesses the same water-vapour resistance factor as the specimen. It is calculated by the following equation:

$$s_d = \frac{Z}{g}[m] \qquad \textit{(equation 2)}$$

Where:

Z	factor that puts together several quantities (humidity difference, air pressure, temperature); for the present measuring conditions Z = 35,7 [g/(m x d)] applies.
g	water vapour transmission rate [g/(m² x d)]
s_d	diffusion-equivalent air layer thickness [m]

Water-vapour resistance factor μ

The *water-vapour resistance factor μ [-]* indicates how many times greater the diffusion resistance of a material is than that of a stationary air layer of the same thickness at the same temperature. The water-vapour resistance factor is calculated by the following equation:

$$\mu = \frac{s_d}{s} \; [-] \qquad \text{(equation 3)}$$

Where:

μ water-vapour resistance factor [-]

s_d water-vapour diffusion-equivalent air layer thickness [m]

s mean thickness of the specimen [m]

4.3 Results

The results of the measurements are summarised in the following table 2.

Table 2: Characteristics of the water-vapour transmission of ***Rollbase P/V***

test specimen	g [g/m² x d]	s_d (H_2O) [1)] [m]	μ [1)] []	layer thickness [mm]
1	0,19	193	112000	1,72
2	0,22	164	98000	1,67
3	0,20	181	107000	1,70
Mean value	**0,20**	**179**	**106000**	**1,70**

1) rounded to 3 value-indicating digits

The graphical illustration of the change of mass as a function of the time period is to be taken from figure 1 of the enclosure.

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5 SUMMARY

At Polymer Institut the water vapour permeability of

Rollbase P/V

according to EN 1931 *"Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of water vapour transmission properties"* was determined by order of INDEX S.p.A., Castel D'Azzano/Italy.

The results are to be taken from table 2.

Flörsheim-Wicker, 2011-08-31

The head of the testing laboratory

J. Magner

Polymer Institut Flörsheim-Wicker

the persons in charge

Dipl.-Ing. N. Machill

C. Preller

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Prüfbericht

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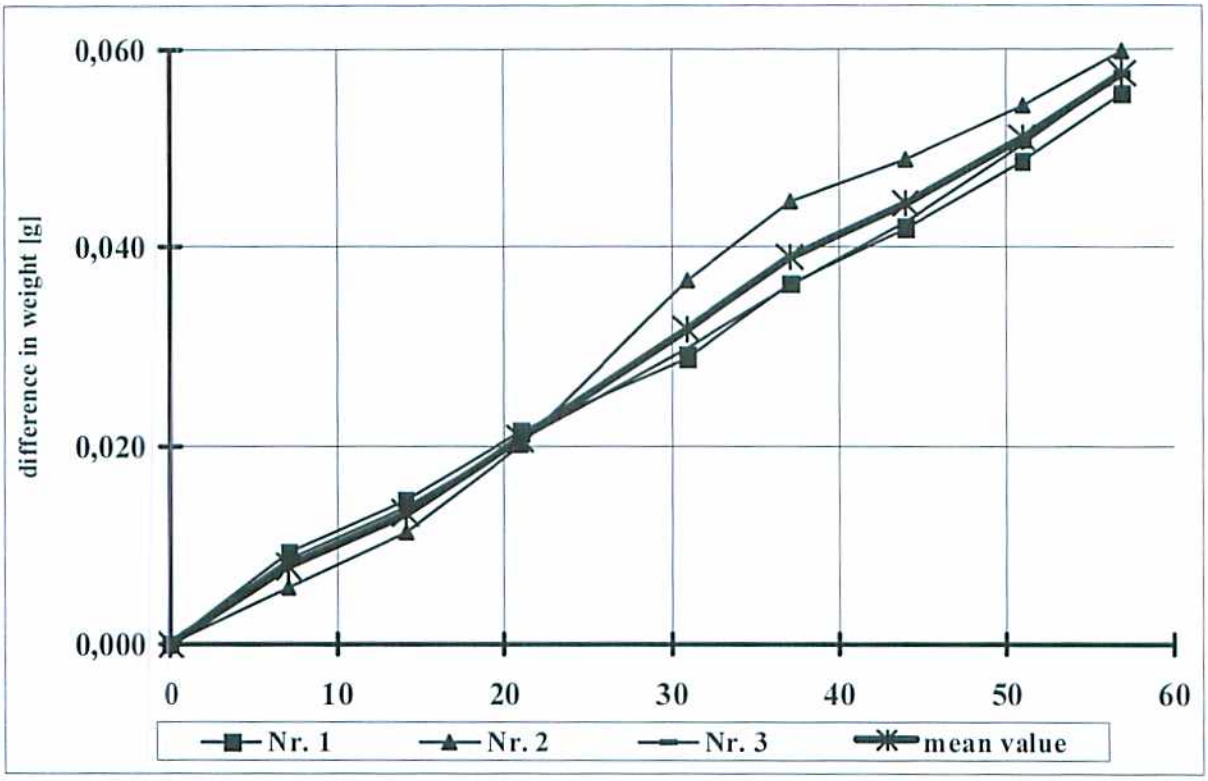

Figure 1: water vapour transmission rate of ***Rollbase P/V***