Forschungsinstitut für polymere Baustoffe
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Test report

P 3141-E

Testing order: **Determination of the water vapour permeability of Polyment ABS 410**

Customer: **Heidelberger Bauchemie GmbH**
Marke Polyment
Peter-Schuhmacher-Straße 8
69181 Leimen

Persons in charge: **J. Magner**
Dipl.-Ing. N. Machill

Date of the test report: **2003-03-21**

This test report comprises: **7 pages**
1 enclosure

The test results exclusively refer to the tested materials.
The publication of the test report in extracts and references to tests for advertising purposes require our written agreement in each individual case.

CONTENTS

1 SUBJECT

The Polymer Institut has been charged by Heidelberger Bauchemie GmbH, Marke Polyment, Leimen, by letter, dated 2002-12-05, to determine the water vapour permeability of the coating material

Polyment ABS 410

in accordance with DIN EN ISO 7783-2 and DIN EN ISO 12572 respectively.

2 RECEIPT OF SAMPLES

On 2002-12-12 the following sample was received at the Polymer Institut:

No.	Material	Container	Quantity
1	Polyment ABS 410	PP pail	2 kg

Product description

Following the technical data sheet *Polyment ABS 410* is a 1-component, ploymer-modified, cement-bound, self-levelling coating material for a coating thickness of 4 mm to 15 mm.

3 PREPARATION OF TEST SPECIMENS

The test specimens have been prepared by a staff member of the Polymer Institut at standard atmosphere DIN 50 014-23/50-2.

Mixing proportion

Material	Mixing proportion in parts by mass
Polyment ABS 410 : water	100 : 20

For mixing a drilling machine with wing stirrer has been used. At first, the water has been placed in a container and then the powder component has been added successively.

The mixing time was 3 min. After a waiting time of 1 min the material has been mixed once again.

Test specimen

From *Polyment ABS 410* a film of thickness about 9 mm has been prepared on a non-adhering foil from which prior to curing circular test specimens of diameter 90 mm have been punched out.

Storage

Prior to the commencement of the test, the test specimens have been stored for at least 28 days at standard atmosphere DIN 50 014-23/50-2.

4 TESTING

4.1 Procedure and calculation

The water vapour permeability has been tested in accordance with DIN EN ISO 7783-2. In accordance with this standard

- the water-vapour transmission rate V [g/(m² x d)] and
- the diffusion-equivalent air layer thickness s_d [m]

have been calculated.

The

- water vapour transmission resistance number μ [ ]

has been calculated in accordance with DIN EN ISO 12572.

From the free films circular test specimens of diameter 90 mm have been punched out. The thickness of the circular test specimens has been determined prior to the measurement, using a micrometer.

Testing

The test specimens have been arranged in aluminium dishes containing saturated ammonium dihydrogen phosphate solution to produce a relative humidity of 93 % at 23 °C.

The dishes have been stored free from draughts at standard atmosphere DIN 50014-23/50-2. They have been regularly weighed, and the mass loss has been detemined each time until the decrease was linear with the time (static condition). The water-vapour transmission rate V is characterised by the mass of water vapour in [g] that is transmitted through 1 m^2 of the specimen under specified conditions (temperature, humidity gradient) within 24 hours.

From the mass loss under stationary conditions the above mentioned quantities have been calculated:

Water-vapour transmission rate V

The w*ater-vapour transmission rate V* is calculated using the following equation:

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

Where:

Δm Mass difference in the respective period of time [g]
A Area of the specimen [m^2]
t Period of time [d]

Water-vapour diffusion-equivalent air layer thickness s_d

Die *water-vapour diffusion-equivalent air layer thickness s_d in [m]* indicates the thickness of a static air layer which has the same water-vapour transmission resistance as the specimen. It is calculated using equation 2:

$$s_d = \frac{Z}{V}\,[m] \qquad (Equation\ 2)$$

Where:

Z Factor which summarises different quantities (humidity gradient, air pressure, temperature); in accordance with DIN EN ISO 7783-2 it is Z = 21 [g/(m x d)].
V Water-vapour transmission rate [g/(m^2 x d)]
s_d Diffusion-equivalent air layer thickness [m]

Water-vapour transmission resistance number μ

The *water-vapour transmission resistance number μ [ ]* indicates how many times greater the transmission resistance of a material is than that of a static air layer of the same thickness of the same temperature. It is calculated using equation 3:

$$m = \frac{s_d}{s} \left[\frac{m}{m}\right] \qquad \textit{(Equation 3)}$$

Where:

μ Water-vapour transmission resistance number [ ]
s_d Diffusion-equivalent air layer thickness [m]
s Thickness of the specimen [m]

4.2 Results

The results obtained are to be taken from the following table:

Table 1: Water-vapour permeability of ‚Polyment ABS 410'

No.	Water-vapour transmission rate V [g/(m² x d)]	s_d (H_2O) [m]	Dry film thickness [µm]	μ (H_2O) [1)] [ ]
1	11,6	1,81	9316	190
2	10,7	1,96	9552	210
3	11,4	1,84	9362	200
4	11,1	1,90	9982	190
MV	**11,2**	**1,88**	**9553**	**200**

[1)] = rounded to two value-indicating digits

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

On the basis of the water-vapour transmission rate V obtained the coating material *Polyment ABS 410* is to be allocated in accordance with DIN EN ISO 7783-2 to the

class III (low).

5 SUMMARY

At the Polymer Institut the water vapour permeability of the coating material

Polyment ABS 410

of the Heidelberger Bauchemie GmbH, Leimen, has been determined in accordance with DIN EN ISO 7783-2 and DIN EN ISO 12572 respectively.

Information on the results is given in the preceding clauses.

Flörsheim-Wicker, 2003-03-21

The head of the institute

i. A.

J. Magner

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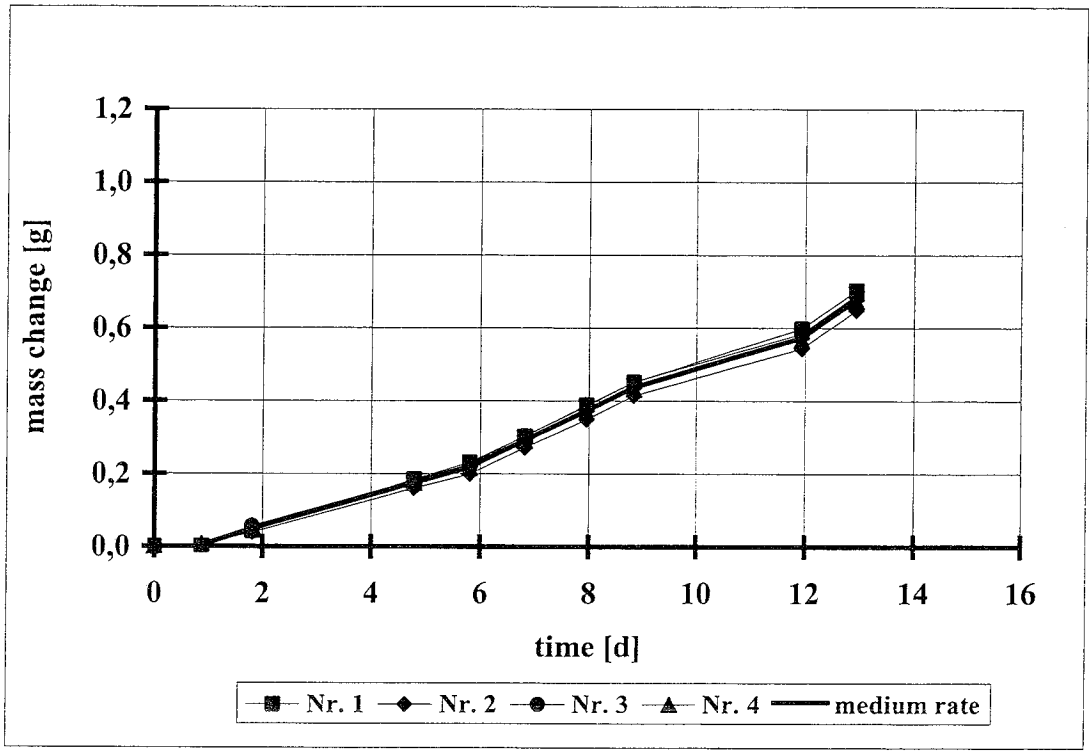
The person in charge

Dipl.-Ing. (FH) N. Machill (Mrs.)

enclosure

to

test report P 3141-E



picture 1: water-vapour diffusion of *Polyment ABS 410*