Test

Air permeability and watertightness of installation foam

Test Report 10-001777-PR01 (PB-K05-02-en-01)

Client **Henkel AG & Co. KG**
Henkelstraße 67

D-40589 Düsseldorf
Germany

Product	Installation foam (in-situ foam)
Designation	1K-PU Pistolenschaum Teroson TS 537 (gunned foam)
Dimensions	Joint cross section 20 mm x 60 mm
Material	One-component, moisture curing PU-based installation foam
Special features	The air permeability of the installation foam was determined for an "ideal" joint and in new condition on the basis of DIN 18542, Clause 7.2. The results cannot be used to demonstrate air tightness and watertightness of connecting joints between building components (gunned with foam) in practical end-use applications.

Results

Air permeability in new condition

$a < 0.1\ m^3 / [h \cdot m \cdot (daPa)^{2/3}]$

Watertightness
in new condition

No water penetration at up to 750 Pa

ift Rosenheim
08 June 2011

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Basis

Test based on DIN 18542:1999-01 *), Sealing of outside wall joints with impregnated sealing tapes made of cellular plastics, Clause 7.2, Air permeability *)

Test standard/s:
EN 12114 : 2000-03
EN 1027 : 2000-06

*) see explanations in test report

Representation of test specimen

Instructions for use

This test report serves to demonstrate the above material property

Validity

The data and results given relate solely to the tested and described specimen.

The effects of weathering and ageing have not been covered.

Notes on publication

The **ift** Guidance Sheet "Conditions and Guidance for the Use of **ift** test reports" applies.

The cover sheet can be used as an abstract.

Contents

The report comprises a total of 6 pages.

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1 Object

1.1 Description of test specimen

The description is based on inspection of the test specimen at **ift** Rosenheim. Item designations/numbers as well as material specifications were given by the original client.

Product designation	1K-PU Pistolenschaum Teroson TS 537 (gunned foam)
Material / Base	one-component, moisture curing PU-based installation foam (in-situ foam), colour: white
Weight per unit area	18 kg/m^3
Cell structure	fine to medium sized pores, mainly closed pores

For more technical details refer to the Technical Sheet of the client

For testing, the installation foam was gunned into a test apparatus composed of square aluminium tubes. The test was based on DIN 18542, Clause 7.2 and Fig. 1, test specimen for air permeability test of linear joints. Spacer discs inserted between the square tubes ensured uniform joint width of 20 mm. Joint depth was 60 mm.

3 joints of each 1,000 mm joint length were produced for the test. After the time specified by the manufacturer to achieve full loading capacity, the installation foam squeezed out from the joint was cut off on both sides flush with the joint.

1.2 Representation of test specimen

The photographs were taken at the **ift** during testing.

Fig. 1 Joints gunned with foam in test apparatus for linear joints according to DIN 18542, mounted in window test rig

2 Procedure

2.1 Sampling

The samples were selected by the original client.

Delivered on	8 February 2011 by the original client.
Preparation	The installation foam was gunned by the staff of the testing body into the test apparatus on 08 February 2011. Prior to gunning the foam, the test apparatus and the cans containing the foam were conditioned at standard atmosphere (23 C, 50 % rel. humidity) for at least 1 week. During gunning the installation foam, the joint faces and the foam surfaces were wetted with water sprayed from a spray bottle. Prior to the test, the test device including the foamed joints were stored at standard atmosphere for at least one week.

2.2 Method/s

Basis

DIN 18 542 : 1999-01	Sealing of outside wall joints with impregnated sealing tapes made of cellular plastics - Impregnated sealing tapes - Requirements and testing (subtest as per Clause 7.2) Since there is no comparable standard known for the objective of testing this installation foam, the test set-up was based on this standard.
EN 12114 : 2000-03 *)	Thermal performances of buildings - Air permeability of building components and building elements - Laboratory test method
EN 1027 : 2000-06	Windows and doors - Watertightness - Test method
Boundary conditions	as per standard specifications

2.3 Measuring and test equipment

Window test rig	Device No.: 22200

2.4 Testing

Date/Period	30 March 2011
Testing personnel	Thomas Stefan, Dipl.-Ing. (FH)

2.5 Test sequence

2.5.1 Air permeability test

Fig, 1 below plots the test sequence (pressure steps) according to EN 12114 to determine air permeability.

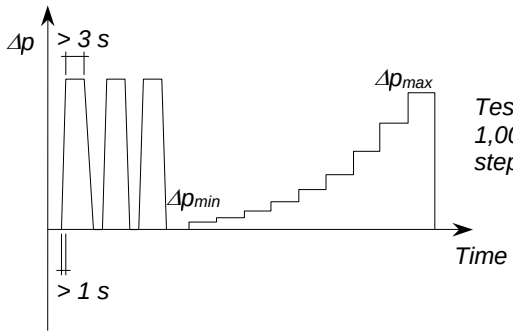

Fig. 1 Test sequence (pressure steps)

Leakages of the test set-up were determined by comparative measurement (zero measurement) during which the joints to be tested were masked air-tight and recorded. These leakages were then taken into account for the subsequent air permeability test of the joints. Thus only the air flow through the tested in-situ foamed joints was determined.

2.5.2 Watertightness test

The test is based on DIN EN 1027 using a water flow rate of approx. 2 l/(min m²) (Fig. 2).

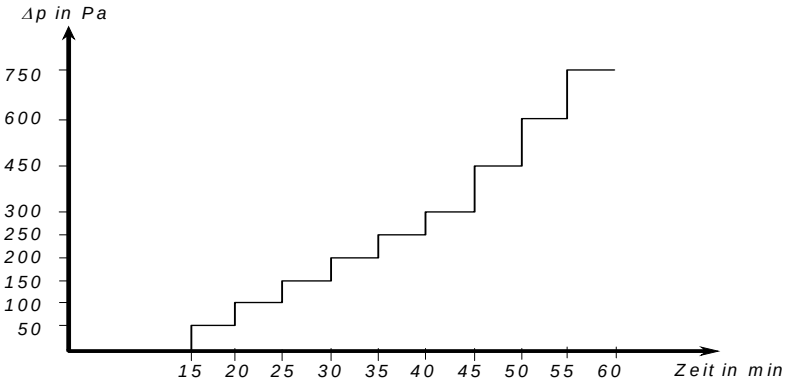

Fig. 2 Representation of pressure pulses and time sequence

3 Results

3.1 Air permeability test in new condition

The measured results are used to determine linear air permeability [m³/(hm)] up to a test pressure difference of 1,000 Pa. Table 1 lists the values. Diagram 1 shows the plotted values. Diagram 1 shows also, for orientation, the requirements for evaluation of air permeability of linear joints as per DIN 4108, Part 2, expressed by the joint permeability coefficient a where a < 0.1 m³ / [h m (daPa)$^{2/3}$].

Table 1 Results of air permeability test

Pressure steps	Pa	50	73	106	154	225	325	473	688	1,000
Air flow	m³/h	*)			0.01	0.01	0.01	0.01	0.02	0.02
	m³/hm	*)			0.002	0.002	0.003	0.004	0.005	0.005

*) No measurable air flow. Measuring accuracy of test setup was 0.01 m³/h.

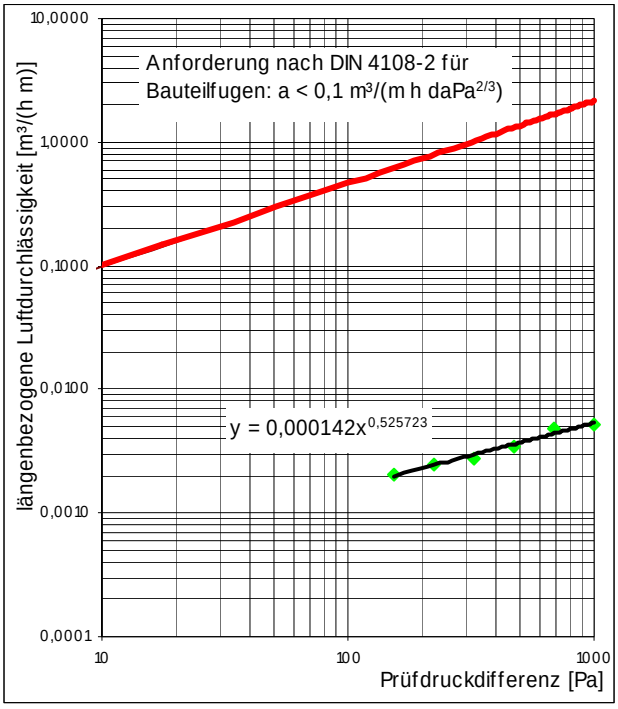

Diagram 1 Linear air permeability of installation foam for an "ideal" joint of 20 mm x 60 mm cross section.

3.2 Watertightness test in new condition

When testing for watertightness,

no water penetration up to 750 Pa

through the foamed joints was detected.

The results were obtained from measurement in new condition with uniform joint widths and smooth as well as parallel joint faces, i.e. for an "ideal" joint. The effects and changes resulting from weathering and/or ageing, different nature of the joint faces and any joint movements, have not been taken into account. Thus the results cannot be used for any connecting joints (gunned with foam) in practical end use applications.

ift Rosenheim
08 June 2011