Staatliche Materialprüfungsanstalt Darmstadt
[State Materials Testing Institute Darmstadt]
Leitung: Prof. Dr.-Ing. C. Berger
Grafenstraße 2, 64283 Darmstadt, Deutschland

Abteilung Baustoffe
[Building material department]

DAP-PL-3289.00

Test Report B 07 0596.2-U E

Customer:	**Hermann Otto GmbH** Krankenhausstraße 14 83413 Fridolfing Germany
date of order:	2007-03-30 order-No. / your reference: /
subject:	**Testing in accordance with EN 1279-4** **1K-silicon sealant "OTTOSEAL S 9"** **for multi-pane insulating glass systems** • Adhesion in accordance with EN 1279-4, chapter 5.1 • Moisture vapour transmission in accordance with EN 1279-4, chapter 5.2
test object:	See page 2
sampling:	Not official, by customer
receipt of samples:	2007-03-30

Darmstadt, 2007-06-08
our reference: B/Hos

Pages : 3
Tables : 1
Figures : 1
Enclosures : 2

The Management

By proxy

(Dr.-Ing. P. Hof)

Official in charge

(Dipl.-Ing. H.-J. Hosemann)

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1. Adhesion in accordance with EN 1279-4, chapter 5.1

1a. Test specimens

27 specimens in accordance with EN 1279-4, Annex A, chapter A.1
of 1K-silicon sealant "**OTTOSEAL S 9**" for multi-pane insulating glass systems

1b. Test procedure and test results

The test has been carried out in accordance with EN 1279-4, chapter 5.1.

The specimens had been aged first in accordance with EN 1279-4, chapter 5.1.3 :

7 specimens in accordance with chapter 5.1.3.1:
A – No Ageing (initial cure)

6 specimens in accordance with chapter 5.1.3.2:
B – Heating (168 h at 60°C)

7 specimens in accordance with chapter 5.1.3.3:
C – Water immersion (168 h at norm climate 23/50)

7 specimens in accordance with chapter 5.1.3.4:
D – UV radiation (96 h)

Following to aging are accomplished tensile tests at the specimens, according EN 1279-4, section 5.1.1. Table 1 shows the tensions at the intersection of the tensions/stretch curves with the line of A-B in accordance with EN 1279-4, fig. 1 tension/stretch triangle (C in fig. 1 on page 3):

Table 1:

Specimen Nr.	Stress σ in MPa at point C in accordance figure 1 after conditioning			
	A	B	C	D
1	0,24	~~0,23~~	~~0,28~~	~~0,28~~
2	0,25	0,27	0,28	0,28
3	0,26	0,28	~~0,29~~	0,28
4	0,25	0,26	0,28	~~0,27~~
5	0,25	0,25	0,28	0,28
6	/ [2)]	0,28	0,29	0,27
7	/ [2)]	/	0,28	0,27
average[1)] σ_{av}	**0,25**	**0,27**	**0,28**	**0,28**

[1)] average off 5 values (only min and max values)
[2)] breakage of glass

At all in table 1 specified values of tensile test, resulted outside of tension/stretch triangle 0AB coherence breaks.

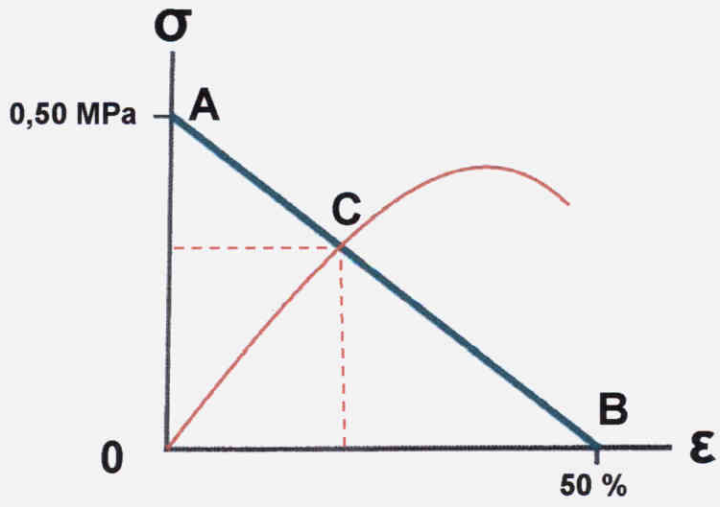

Figure 1: EN 1279-4, Figure B.1 – stress strain triangle 0AB

2. Moisture vapour transmission in accordance with EN 1279-4, chapter 5.2

2a. Test specimens

2 foils of 1K-silicon sealant "**OTTOSEAL S 9**" for multi-pane insulating glass systems
diameter in mm: 150
Thickness specimen 1 in mm: 1,9
Thickness specimen 2 in mm: 1,9

2b. Test procedure and test results

Moisture vapour transmission rate (MVTR)

The test has been carried out in accordance with EN 1279-4, Annex C.

The specimen is attached in such a way, on the open mouth of one with desiccant filled test dish, that it locks these hermetically. The test arrangement will be stored in a regulated atmosphere (relative humidity 100%). Periodic weightings determine the rate of moisture vapour movement through the specimen into the desiccant.

Test time: 24 days

Test result MVTR in g/m² * 24 h * 2 mm:

Specimen 1: 9,2
Specimen 2: 9,2

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Enclosure 1 to Test Report B 07 0596.2-U E

Summary of test report B 07 0596.2-U E from 2007-06-08

Insulating glass units – results of test according EN 1279-4, 5.1 and 5.2

Customer:
Hermann Otto GmbH
Krankenhausstraße 14
83413 Fridolfing
Germany

Manufacturer:
Hermann Otto GmbH
Krankenhausstraße 14
83413 Fridolfing
Germany

Specification of sealant: **OTTOSEAL S 9**
Sealant of insulating glass units succesfully tested according EN 1279-2, test report No.: /
Specification of glass, if not floatglass: /

Adhesion in accordance with EN 1279-4, chapter 5.1

Alterung	At intersection with line A-B (EN 1279-4, figure B.1)		Type of failure C = cohesive, A = adhesive				
	Average stress σ_{av} in MPa	Average extension ε_{av} in %	1	2	3	4	5
Initial cure	0,25	25	C	C	C	C	C
Water immersion	0,27	23	C	C	C	C	C
Heating 60 °C	0,28	22	C	C	C	C	C
UV radiation	0,28	21	C	C	C	C	C

Moisture vapour transmission in accordance with EN 1279-4, chapter 5.2

Foil thickness in mm: 2,0 ± 0,1
$\Delta\rho_{H_2O}$ in %: 100
Temperature in °C: 23 ± 1
MVTR in g/m² * 24 h * 2 mm: **9,2**

The sealant is conforming with the criteria specified by the client: YES

The Management

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(Dr.-Ing. P. Hof)

Official in charge

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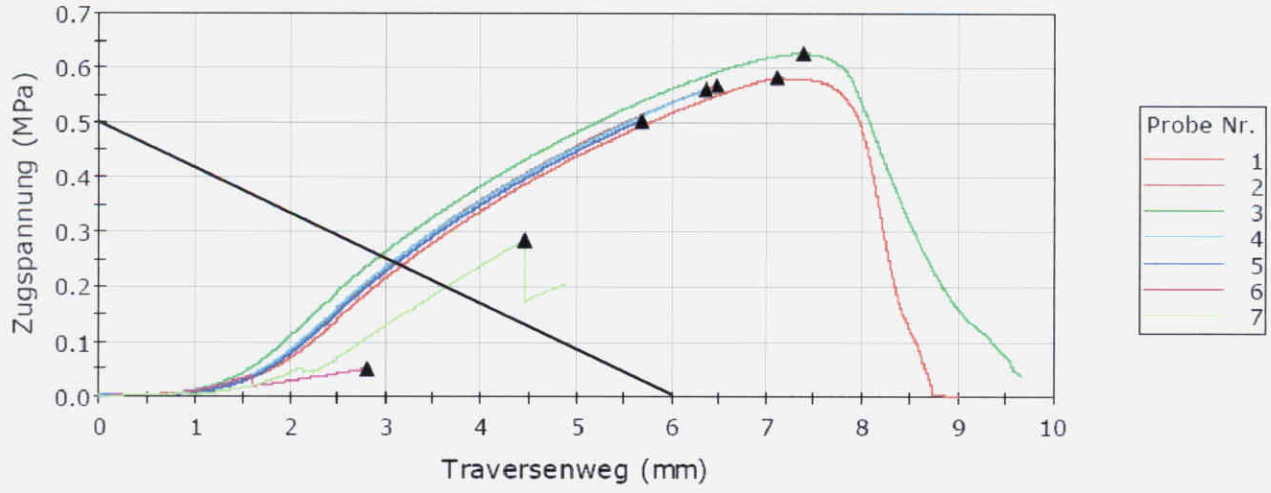

Figure 1:
Tensile test at specimens in accordance with EN 1279-4, chapter 5.1.3.1: **No Ageing**

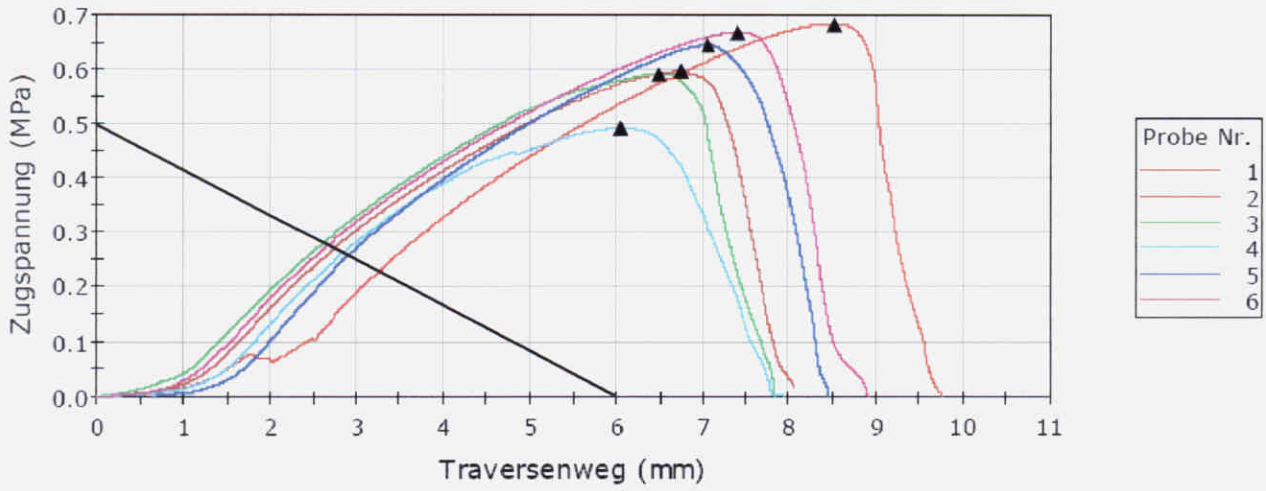

Figure 2:
Tensile test at specimens in accordance with EN 1279-4, chapter 5.1.3.2: **Heating**

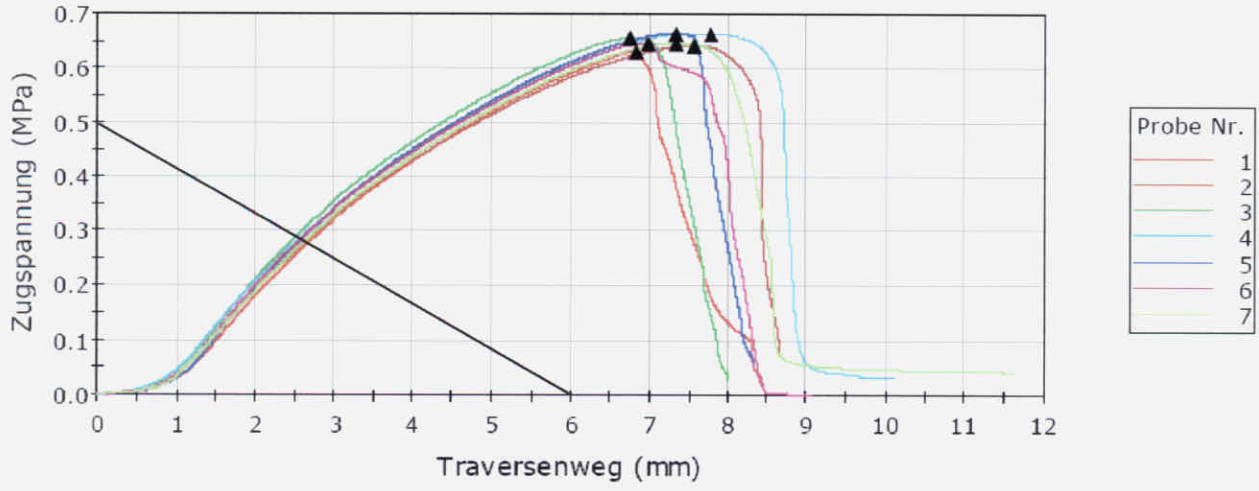

Figure 3:
Tensile test at specimens in accordance with EN 1279-4, chapter 5.1.3.3: **Water immersion**

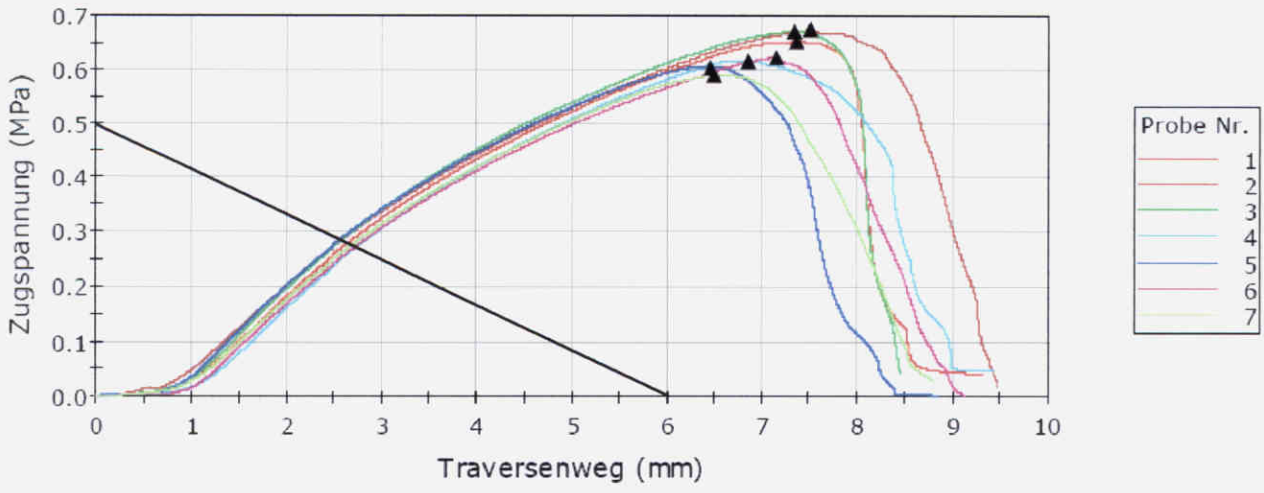

Figure 4:
Tensile test at specimens in accordance with EN 1279-4, chapter 5.1.3.4: **UV radiation**