

**Test report no.:** 102993/12-I-E

**Customer:** Sika Services AG  
Elastic Sealing & Bonding  
Tüffenwies 16  
8048 Zürich  
SWITZERLAND

**Order:** Performance Test of the non-structural joint sealant **Sikaflex® AT Facade** in accordance with EN 15651-1 Sealants for non-structural use in joints in buildings and pedestrian walkways - Part 1: Sealants for facade elements

**Email of:** 2012-08-28

**Ref.:** Mr. Christian Völlm

**Sample receipt:** 2012-09-12

**Test period:** 2012-09-19 to 2012-12-12

The test report comprises 10 pages and 1 annex.

Würzburg, 2013-10-14  
Sc/km

i. V.



Dr. Anton Zahn



i. A.



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**1. Order**

Company Sika Services AG, Elastic Sealing & Bonding, Tüffenwies 16, 8048 Zürich, SWITZERLAND instructed SKZ - TeConA GmbH by email of 28 August 2012 to test the performance of an one-component joint sealant **Sikaflex® AT Facade** in accordance with EN 15651-1:2010-03 Sealants for non-structural use in joints in buildings and pedestrian walkways - Part 1: Sealants for facade elements. On 29 July 2013, the company Sika Services AG instructed SKZ - TeConA GmbH to issue the test report including the assessment according to EN 15651:2012-09.

**2. Test material**

The SKZ - TeConA GmbH received the following samples for testing (description is based on inspection of the samples at SKZ - TeConA GmbH and on the manufacturer's data):

6 film bags one-component sealant

Designation:	<b>Sikaflex® AT Facade</b>
Type (chemical family):	Silan terminated polymer
Colour:	Grey
Batch number:	3000315031
Sample receipt:	2012-09-12

100 ml one-component primer for absorbent substrates (concrete)

Designation:	<b>Sika® Primer-3 N</b>
Batch number:	0012991708
Sample receipt:	2012-09-12

### 3. Test procedure

The test of the performance of the non-structural joint sealant **Sikaflex® AT Facade** was performed in accordance with EN 15651-1:2012-09, Part 1: Sealants for facade elements, class 25 LM.

The testing scope includes a Product Type Determination according to EN 15651-1.

SKZ - TeConA GmbH is a notified body approved according to the Construction Products Regulation for the product standard EN 15651-1 (code no.: NB 1213).

Unless indicated otherwise, preconditioning and test procedure was performed at standard conditioning atmosphere 23/50, class 1 according to DIN EN ISO 291:2008-08.

#### Production and pre-treatment of test specimens

For the test specimens with the joint dimensions 12 x 12 x 50 mm were produced according to ISO 8340:2005-06.

For the determination of all tensile properties and adhesion/cohesion properties substrate according to the following table was used and prepared:

Substrate according to ISO 13640:1999-12	Primer	Drying time of the primer up to the application of the sealant in the joints
Mortar M1	<b>Sika® Primer-3 N</b>	90 min

Elastic recovery was tested by means of test specimens made of anodic aluminium according to ISO 13640:1999-12, which were cleaned with acetone and subsequently with pure water.

The preconditioning of the test specimens was carried out according to ISO 8340:2005-06, method B.

Method A: Standard conditioning atmosphere 23/50, class 1 according to DIN EN ISO 291:2008-08

Method B: The test specimens were conditioned according to method A and subsequently, subjected three times to the following storage cycle:

- a) 3 days in the oven at  $(70 \pm 2) ^\circ\text{C}$ ;
- b) 1 day in distilled water at  $(23 \pm 2) ^\circ\text{C}$ ;
- c) 2 days in the oven at  $(70 \pm 2) ^\circ\text{C}$ ;
- d) 1 day in distilled water at  $(23 \pm 2) ^\circ\text{C}$

### 3.1 Performance requirements for non-structural sealants for facade elements

#### 3.1.1 Elastic recovery

The test was carried out according to DIN EN ISO 7389:2004-04 with test specimens made of aluminium with a 100 % extension, in relation to the initial joint width.

Requirement:

The elastic recovery shall be at least 70 %.

#### 3.1.2 Resistance to flow

The test was carried out according to DIN EN ISO 7390:2004-04.

Requirement:

According to method A and B at 5 °C and 50 °C the slump (flow) of the joint sealant must not exceed 3 mm.

#### 3.1.3 Tensile properties (secant tensile modulus)

The test was carried out according to ISO 8339:2005-06. The secant tensile modulus was determined on test specimens, which were extended by 100 % of the original width at temperatures of 23 °C and -20 °C.

Requirement:

Secant tensile modulus at 23 °C:  $\leq 0.4$  MPa  
at -20 °C:  $\leq 0.6$  MPa

#### 3.1.4 Tensile properties at maintained extension

The test was carried out according to ISO 8340:2005-06 with an extension of 100 % at temperatures of 23 °C and -20 °C.

Requirement:

After 24 h neither an adhesive nor a cohesive failure shall occur on the test specimens which are extended by 100 %.

#### 3.1.5 Determination of adhesion/cohesion properties at variable temperatures

The test was carried out according to ISO 9047:2001-12. The amplitude of extension/compression was  $\pm 25$  % of the initial joint width.

Requirement:

The joint sealant must not separate from the contact material nor shall the joint sealant display any signs of crack formation.

### 3.1.6 Adhesion and cohesion/properties at maintained extension after immersion in water

The test was carried out according to ISO 10590:2005-07 with an extension of 100 %.

Requirement:

After 24 h neither an adhesive nor a cohesive failure shall occur on the test specimens which are extended by 100 %.

### 3.1.7 Change in volume

The test was carried out according to ISO 10563:2005-07 in a ventilated oven.

Requirement: The change in volume must be  $\leq 10$  %.

## 3.2 Essential characteristics

### 3.2.1 Reaction to fire

The test was performed according to DIN EN ISO 11925-2:2011-02 for classification of the sealant according to DIN EN 13501-1:2010-02. As substrate calcium silicate panels in accordance with EN 13238:2010-02 were used. 6 samples were tested with edge flaming according to EN 15651:2012-09.

The test was not carried out at SKZ - TeConA GmbH, but within the scope of a sub-contract at a testing institute accredited according to DIN EN ISO 17025:2005-08 for the test.

Requirement:

Classification in fire behaviour class between A1 and F

### 3.2.2 Durability

No extra test of durability had been carried out.

Requirement:

In accordance to EN 15651-1:2012-09, the durability can be assessed by the properties of ISO 8339:2005-06 or ISO 8340:2005-06 and the properties of ISO 9046:2002-05, ISO 9047:2001-12, ISO 10590:2005-07 or ISO 10591:2005-07.

### 3.2.3 Release of chemicals dangerous to environment and health

No extra test of the release of chemicals dangerous to environment and health had been carried out.

### 3.3 Additional requirements for the use in cold climates

#### 3.3.1 Tensile properties (secant tensile modulus) at -30 °C

The test was carried out according to ISO 8339:2005-06. The secant tensile modulus was determined on test specimens, which were extended by 100 % of the original width at a temperature of -30 °C.

Requirement:

Secant tensile modulus  $\leq$  0.9 MPa

#### 3.3.2 Tensile properties at maintained extension at -30 °C

The test was carried out according to ISO 8340:2005-06 with an extension of 100 % at a temperature of -30 °C.

Requirement:

After 24 h neither an adhesive nor a cohesive failure shall occur on the test specimens which are extended by 100 %.

### 3.4 Identification requirements

#### 3.4.1 Thermogravimetric test

The test was performed in accordance with EN ISO 11358:1997-04, between 35 °C and 900 °C, temperature slope 10 °C/min, non-oxidative condition (nitrogen).

#### 3.4.2 Specific gravity

The test was performed in accordance with DIN EN ISO 1183-1:2011-03 procedure B with a metal pycnometer.

#### 3.4.3 Shore hardness

The test was performed in accordance with DIN EN ISO 868:2003-10 after preconditioning at standard climate 23/50, class 1, for 28 days.

The test was conducted using a Shore durometer type A. The test specimens were 6 mm thick and 60 mm in diameter.

Readings were taken 3 and 15 seconds after the fixed contact of the pressure foot with the test specimen had been effected.

Three samples were tested and five measurements were taken per sample.

#### 4. Test results - Sikaflex® AT Facade

4.1 Performance requirements for non-structural sealants for facade elements					
	Property	Unit	Requirement		Result
4.1.1	Elastic recovery (DIN EN ISO 7389)	%	≥ 70		88
4.1.2	Resistance to flow (DIN EN ISO 7390)	mm	A vertical 5 °C	≤ 3	0
			A vertical 50 °C	≤ 3	0
			B horizontal 5 °C	≤ 3	0
			B horizontal 50 °C	≤ 3	0
4.1.3	Secant tensile modulus (ISO 8339)	MPa	at 23 °C, 100 % extension	≤ 0.4	0.4
		MPa	at -20 °C, 100 % extension	≤ 0.6	0.5
4.1.4	Tensile properties at maintained extension (ISO 8340)	---	No failure (NF) at -23 °C and -20 °C		NF <sup>1</sup>
4.1.5	Adhesion/cohesion properties at variable temperatures (ISO 9047)	---	No failure (NF)		NF <sup>1</sup>
4.1.6	Adhesion/cohesion properties at maintained extension after immersion in water (ISO 10590)	---	No failure (NF)		NF <sup>1</sup>
4.1.7	Change in volume (ISO 10563)	%	≤ 10		-4.3
4.2 Essential characteristics					
	Property				Result
4.2.1	Reaction to fire (DIN EN ISO 11925-2)				Class E <sup>2</sup>
4.2.2	Durability (EN 15651)				Pass <sup>3</sup>
4.2.3	Release of chemicals dangerous to environment and health (EN 15651)				NPD <sup>4</sup>

<sup>1</sup> Neither adhesive nor cohesive failure occurred.

<sup>2</sup> The test was not carried out at SKZ - TeConA GmbH, but within the scope of a subcontract at a testing institute accredited for the test. The test report and classification report are present at the SKZ - TeConA GmbH.

<sup>3</sup> Durability had been shown by positive results according to EN ISO 8339, EN ISO 8340, EN ISO 9047 and EN ISO 10590.

<sup>4</sup> NPD: No performance determined



<b>4.3 Additional performance requirements for the use in cold climates</b>						
	<i>Property</i>	<i>Unit</i>	<i>Requirement</i>			<i>Result</i>
4.3.1	Secant tensile modulus at -30 °C (ISO 8339)	MPa	≤ 0.9			0.5
4.3.2	Tensile properties at maintained extension at -30 °C (ISO 8340)	---	No failure (NF)			NF <sup>1</sup>
<b>4.4 Identification requirements</b>						
	<i>Property</i>	<i>Unit</i>	<i>Single values</i>			<i>Result</i>
4.4.1	Ash content (EN ISO 11358)	%	---	---	---	22.7 <sup>5</sup>
4.4.2	Specific gravity (DIN EN ISO 1183-1)	g/cm <sup>3</sup>	1.28	1.27	1.28	1.28
4.4.3	Shore hardness (DIN EN ISO 868) after 3 and 15 s	Shore A	3 s: 19	3 s: 19	3 s: 19	3 s: 19
			15 s: 17	15 s: 17	15 s: 17	15 s: 17

<sup>5</sup> The results of the thermogravimetric test are indicated in annex 1.

**5. Assessment of the test results and product type determination**

The one-component non-structural joint sealant **Sikaflex® AT Facade** in conjunction with substrate mortar M1 with primer Sika® Primer-3 N meets the requirements according to EN 15651-1:2012-09, class 25 LM.

This comprises the additional requirements for outdoor applications and the use in cold climates.

<b>Designation</b>	
Type:	Non-structural sealant type F (facade elements)
Intended Use:	EXT-INT (external and internal use)
Further designation:	CC (cold climate)
Substrate:	Mortar M1 with primer Sika® Primer-3 N
Pre-conditioning:	Procedure B (according to ISO 8340)
Class:	25 LM

<< TG/DTA >>

Data Name: sikaflex

Date: 12/12/11 12:52

Sample: Probe 1

11.9762 mg

Reference: Leertiegel

0 mg

Temperature Program:

	[C]	[C/min]	[min]	[sec]
1	30 - 30	10	5	0.3
2*	30 - 900	10	0	0.3
3*	900 - 900	10	15	0.5

Comments:

Operator Scheifele

Auftrag: 102993

Fa. Sika

Sikaflex AT

Facade grau

Annex 1

Test report no. 102993/12-I-E

