

Test report no.: 211400/20-I

Customer: Yoldaş Endüstri Ürünleri San. Ve Tic. A.Ş
ITOB OSB Mah. 10034 Sok.
NO:3 Menderes
IZMIR
TURKEY

Order: Performance Test of the non-structural joint sealant
Elastic NP1® Construction in accordance with EN
15651-1 Sealants for non-structural use in joints in
buildings and pedestrian walkways - Part 1: Sealants for
facade elements, class 25HM

Letter of: 2020-08-27

Ref: Ms. Alev Meland

Sample receipt: 2020-08-27

Test period: 2020-09-01 to 2020-11-20

The test report comprises 11 pages and 1 annex.

Würzburg, 30 November 2020
Lg/km

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Die Ergebnisse beziehen sich auf die geprüften Produkte.

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1. Order

The Company Yoldaş Endüstri Ürünleri San. Ve Tic. A.Ş, ITOB OSB Mah. 10034 Sok., NO:3 Menderes, IZMIR, TURKEY, instructed SKZ - Testing GmbH by letter of 27 August 2020 to test the performance of an one-component joint sealant **Elastic NP1® Construction** in accordance with EN 15651-1:2012-09 Sealants for non-structural use in joints in buildings and pedestrian walkways - Part 1: Sealants for facade elements. At time of testing, the standard EN 15651-1:2012-09 was superseded by EN 15651-1:2017-07. The testing was carried out according to EN 15651-1:2012-09 in accordance with the requirements of the Construction Products Regulation (Regulation No. 305/2011) to enable the CE conformity marking for sealants. For further information see website and the Official Journal of the European Commission.

2. Test material

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

10 cartridges one-component sealant

Designation:	Elastic NP1® Construction
Type (chemical family):	Hybrid
Colour:	White
Batch number:	02772050-20W
Sample receipt:	2020-08-27

3. Test procedure

The test of the performance of the non-structural joint sealant **Elastic NP1® Construction** was performed in accordance with EN 15651-1:2012-09, Part 1: Sealants for facade elements, class 25HM.

The testing scope includes a product type determination according to EN 15651-1.

SKZ - Testing 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.

Usually we carry out tests according to standards for which we have an accreditation. The list of all standards for which we are accredited is shown on the homepage at www.skz.de. In case of non-accredited procedures they are marked with *.

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 DIN EN ISO 8340:2005-09.

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	Without Primer	---
Aluminium (anodised)	Without Primer	---
Glass	Without Primer	---

The test specimens made of glass and anodised aluminium were cleaned with acetone and subsequently with pure water.

The preconditioning of the test specimens was carried out according to DIN EN ISO 8340:2005-09, 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 anodised 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 at $5 ^\circ\text{C}$ and $50 ^\circ\text{C}$ the slump (flow) of the joint sealant must not exceed 3 mm.

3.1.3 Change in volume

The test was carried out according to DIN EN ISO 10563:2017-09 in a forced ventilated oven with open flap.

Requirement:

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

3.1.4 Tensile properties (secant tensile modulus)

The test was carried out according to DIN EN ISO 8339:2005-09. The secant tensile modulus was determined on test specimens, which were extended by 100 % of the original width at temperatures of $23 ^\circ\text{C}$ and $-20 ^\circ\text{C}$.

Requirement:

Secant tensile modulus at $23 ^\circ\text{C}$: $> 0.4 \text{ MPa}$
or
at $-20 ^\circ\text{C}$: $> 0.6 \text{ MPa}$

3.1.5 Tensile properties at maintained extension

The test was carried out according to DIN EN ISO 8340:2005-09 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 %.

3.1.6 Determination of adhesion/cohesion properties at variable temperatures

The test was carried out according to ISO DIN EN ISO 9047:2017-05. The amplitude of extension/compression was ± 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.

3.1.7 Adhesion/cohesion properties at maintained extension after immersion in water

The test was carried out according to DIN EN ISO 10590:2005-10 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 %.

3.2 Essential characteristics

3.2.1 Reaction to fire

The test was performed according to EN ISO 11925-2:2010 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 - Testing 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 Identification requirements

3.3.1 Thermogravimetric test

The test was performed in accordance with DIN EN ISO 11358-1:2014-10, between 35 °C and 900 °C, temperature slope 10 °C/min, non-oxidative condition (nitrogen).

3.3.2 Specific gravity

The test was performed in accordance with DIN EN ISO 1183-1:2013-04 procedure B with a metal pycnometer.

3.3.3 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 1 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 – Elastic NP1® Construction

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		84
4.1.2	Resistance to flow (DIN EN ISO 7390)	mm	A vertical 5 °C	≤ 3	0
			A vertical 50 °C	≤ 3	0
4.1.3	Change in volume (DIN EN ISO 10563)	%	≤ 10		-3.4
Substrate mortar M1 without Primer					
4.1.4	Secant tensile modulus (DIN EN ISO 8339)	MPa	at 23 °C, 100 % extension	> 0.4 or	0.8
		MPa	at -20 °C, 100 % extension	> 0.6	1.0
4.1.5	Tensile properties at maintained extension (DIN EN ISO 8340)	---	No failure (NF) at 23 °C and -20 °C		NF ¹
4.1.6	Adhesion/cohesion properties at variable temperatures (DIN EN ISO 9047)	---	No failure (NF)		NF ¹
4.1.7	Adhesion/cohesion properties at maintained extension after immersion in water (DIN EN ISO 10590)	---	No failure (NF)		NF ¹
Substrate aluminium (anodised) without primer					
4.1.4	Secant tensile modulus (DIN EN ISO 8339)	MPa	at 23 °C, 100 % extension	> 0.4 or	0.8
		MPa	at -20 °C, 100% extension	> 0.6	0.9
4.1.5	Tensile properties at maintained extension (DIN EN ISO 8340)	---	No failure (NF) at 23 °C and -20 °C		NF ¹
4.1.6	Adhesion/cohesion properties at variable temperatures (DIN EN ISO 9047)	---	No failure (NF)		NF ¹
4.1.7	Adhesion/cohesion properties at maintained extension after immersion in water (DIN EN ISO 10590)	---	No failure (NF)		NF ¹
Substrate glass without primer					
4.1.4	Secant tensile modulus (DIN EN ISO 8339)	MPa	at 23 °C, 100 % extension	> 0.4 or	0.8
		MPa	at -20 °C, 100% extension	> 0.6	1.0
4.1.5	Tensile properties at maintained extension (DIN EN ISO 8340)	---	No failure (NF) at 23 °C and -20 °C		NF ¹
4.1.6	Adhesion/cohesion properties at variable temperatures (DIN EN ISO 9047)	---	No failure (NF)		NF ¹
4.1.7	Adhesion/cohesion properties at maintained extension after immersion in water (DIN EN ISO 10590)	---	No failure (NF)		NF ¹

¹ Neither adhesive nor cohesive failure occurred.

4.2 Essential characteristics						
	Property					Result
4.2.1	Reaction to fire (EN ISO 11925-2)					Class E ²
4.2.2	Durability (EN 15651)					Pass ³
4.2.3	Release of chemicals dangerous to environment and health (EN 15651)					NPD ⁴
4.3 Identification requirements						
	Property	Unit	Single values			Result
4.3.1	Ash content (DIN EN ISO 11358)	%	---	---	---	31.8 ⁵
4.3.2	Specific gravity (DIN EN ISO 1183-1)	g/cm³	1.42	1.42	1.43	1.42
4.3.3	Shore hardness (DIN EN ISO 868) after 1 and 15 s	Shore A	1 s: 38	1 s: 37	1 s: 38	38
			15 s: 40	15 s: 39	15 s: 40	40

² The test was not carried out at SKZ - Testing 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 - Testing GmbH.

³ Durability had been shown by positive results according to ISO 8339, ISO 8340, ISO 9047 and ISO 10590.

⁴ NPD: No performance determined.

⁵ 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 **Elastic NP1® Construction** in conjunction with substrate mortar M1 (without primer), aluminium (anodised) (without primer) and Glass (without primer) meets the requirements according to EN 15651-1:2012-09, class 25HM.

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

Designation	
Type:	Non-structural sealant type F (facade elements)
Intended Use:	EXT-INT (external and internal use)
Substrate:	Mortar M1 (without primer)
	Aluminium (anodised) (without primer)
	Glass (without primer)
Pre-conditioning:	Procedure B (according to DIN EN ISO 8340)
Class:	25HM

