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Authorized and notified according to Article 10 of the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products (89/106/EEC)

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Evaluation Report ETA-12/0046

(English language translation, the original version is in French language)

Trade name: Nom commercial :	**ELEGANCE-52G01**
Holder of approval: Titulaire :	**SAPA BUILDING SYSTEM SA** **Industrielaan 17** **BE-8810 LICHTERVELDE** **Belgium**
Generic type and use of construction product: Type générique et utilisation prévue du produit de construction :	**Structural sealant glazing system kit** Système de vitrages extérieurs collés

Introduction

This report describes the methods used to assess the fitness for use of the structural sealant glazing frames ELEGANCE-52G01 introduced by the company SAPA BUILDING SYSTEM SA in accordance with the Essential Requirements as specified in the ETA Guideline 002.

The structural sealant glazing frames are intended to be set up in curtain walls or glazing roofs.

This report is based on tests results performed in the framework of the ETA instruction, on available data and experience of 25 years.

The evaluation range is limited to bonding of the glasses on the specific support profile (ref. 52G01) with the relevant accessories (self weight support, profiles, setting blocks, and retaining devices).

The evaluation of the facade or glazing roof including the structural sealant frame is not part of this document. It shall comply with relevant specifications (EN 13830, pr EN 14351 or national regulation).

1. COMPONENTS

The identification of:

- the structural sealants,
- the aluminium frames,
- the glasses,

is given in the ETA.

1.1 Intended use

Structural sealant glazing system for use as infill for facade or glazing roof.

2. ASSESSMENT OF THE FITNESS FOR USE

2.1 ER1 – Mechanical resistance and stability

Not applicable.

2.2 ER2 – Safety in case of fire

- Reaction to fire

  Class F: no performance determined.

- Resistance to fire

  No performance determined.

2.3 ER3 – Hygiene, health and environment

- Air permeability and watertightness

  No performance determined.

  Not relevant for the frame itself.

- Dangerous substances

  The ETA holder and his supplier have made a declaration of conformity to the Council Directive 76/769/EEC and its amendments.

- Dampness

  The risk of condensation shall be calculated case by case according to EN 10077 - Part 2 depending on internal relative humidity in the building.

2.4 ER4 – Safety in use

2.4.1 Structural sealants

The structural sealants have been assessed in the framework of their own ETA on float glass; specific coated glass declared in the ETA and anodised aluminium.

DC 993	from DOW CORNING	ETA-01/0005
DC 895	from DOW CORNING	ETA-01/0005
DC 3362	from DOW CORNING	ETA-03/0003
VEC 99	from TREMCO	ETA-05/0005
VEC 90	from TREMCO	ETA-05/0005
Proglaze II	from TREMCO	ETA-05/0006
Proglaze 580	from TREMCO	ETA-09/0166
JS 562	from TEMCO	--

Tests results summary for structural glazing sealant JS 562 from TREMCO ILLBRUCK company performed according to the Guide of European Technical Approval ETAG n. 002 (edition 1999) – (test report n° BEB6-A-0017/1 GB).

Tests	Reference	Requirements	Results
1- Identification			
> Specific gravity	ETAG 002 § 5.2.1.1.	recording	1,35
> Shore A Hardness	ETAG 002 § 5.2.1.2.	recording	35
> Thermogravimetric analysis	ETAG 002 § 5.2.1.3.	recording	Residue 900℃= 25,2% (see curve in test report)
> Colour	ETAG 002 § 5.2.1.4.	recording	black
2- Characterisation			
> Gas inclusion	ETAG 002 § 5.1.4.6.1.	No inclusion	No inclusion
> Elastic recovery	ETAG 002 § 5.1.4.6.2.	> 95 %	96 %
> Shrinkage	ETAG 002 § 5.1.4.6.3.	< 10,0 %	2,6 %
> Resistance to tearing	ETAG 002 § 5.1.4.6.4.	$X_{mean,tear} / X_{mean,23℃} > 0,75$	$X_{mean,tear} / X_{mean,23℃} = 0,80$
> Mechanical fatigue	ETAG 002 § 5.1.4.6.5.	$X_{mean,fatigue} / X_{mean,23℃} > 0,75$	$X_{mean,tear} / X_{mean,23℃} = 0,99$
> Elastic modulus	ETAG 002 § 5.1.4.6.7.	recording	0,98 MPa
3- Mechanical resistance on mixed specimens glass / metal (anodised aluminium)			
3-1 Initial mechanical resistance			
> Tensile, rupture (-20℃ / +23℃ / +80℃)	ETAG 002 § 5.1.4.1.1.	$X_{mean,-20℃} / X_{mean,23℃} > 0,75$ $X_{mean,+80℃} / X_{mean,23℃} > 0,75$ Cohesive failure 90%	$R_{u,5\ (+23℃)} = 1,04$ $X_{mean,-20℃} / X_{mean,23℃} = 0,99$ $X_{mean,+80℃} / X_{mean,23℃} = 1,00$ Cohesive failure 100%
> Shear, rupture (-20℃ / +23℃ / +80℃)	ETAG 002 § 5.1.4.1.2.	$X_{mean,-20℃} / X_{mean,23℃} > 0,75$ $X_{mean,+80℃} / X_{mean,23℃} > 0,75$ Cohesive failure 90%	$R_{u,5\ (+23℃)} = 0,99$ $X_{mean,-20℃} / X_{mean,23℃} = 0,96$ $X_{mean,+80℃} / X_{mean,23℃} = 1,06$ Cohesive failure 100%
3-2 Residual mechanical resistance after artificial ageing			
> Tensile, rupture after immersion in water at high-temperature (45℃) with solar radiation (Xenon) during 2x504 h.	ETAG 002 § 5.1.4.2.1.	$X_{mean,UV} / X_{mean,23℃} > 0,75$ $0,50 \leq K_{12,5\ \%\ uv.} / K_{12,5\ \%\ 23℃} \leq 1,10$ Cohesive failure 90%	$X_{mean,UV} / X_{mean,23℃} = 0,80$ $K_{12,5\ \%\ uv.} / K_{12,5\ \%\ 23℃} = 0,74$ Cohesive failure 100%
> Tensile, rupture after exposure in NaCl atmosphere during 480 hours	ETAG 002 § 5.1.4.2.2.	$X_{mean,NaCl} / X_{mean,23℃} > 0,75$ Cohesive failure 90%	$X_{mean,UV} / X_{mean,23℃} = 0,80$ Cohesive failure 100%
> Tensile, rupture after exposure in SO_2 atmosphere during 20 cycles	ETAG 002 § 5.1.4.2.3.	$X_{mean,SO2} / X_{mean,23℃} > 0,75$ Cohesive failure 90%	$X_{mean,UV} / X_{mean,23℃} = 0,79$ Cohesive failure 100%
4- Mechanical resistance on specimens glass / glass			
4-1 Residual mechanical resistance after artificial ageing			
> Tensile, rupture after immersion in water at high-temperature (45℃) with solar radiation (Xenon) during 2x504 h.	ETAG 002 § 5.1.4.2.1.	$X_{mean,UV} / X_{mean,23℃} > 0,75$ $0,50 \leq K_{12,5\ \%\ uv.} / K_{12,5\ \%\ 23℃} \leq 1,10$ Cohesive failure 90%	$X_{mean,UV} / X_{mean,23℃} = 0,79$ $K_{12,5\ \%\ uv.} / K_{12,5\ \%\ 23℃} = 0,98$ Cohesive failure 100%

2.4.2 Anodised aluminium profile for structural seal adhesion surface

The anodizing of the structural adhesion surface profile ref. 52G01 is performed by the firm SAPA PROFILES NL BV – Industrieweg 15 – 3840 Harderwijk – Netherland.

The characteristics of this aluminium profile and the anodisation are given in the ETA (§ 2.1.1.2):

Anodising characteristics of the structural sealant adhesion surface

Characteristics	Method	Criteria EOTA	Nominated value
Thickness	EOTA § 5.2.2.1.1.	Mean minimum thickness: 15 µm	15 µm
Sealing:			
Sealing degree Weight lost	EOTA § 5.2.2.1.2	EN 12373-6: < 30 mg/dm^2	< 20 mg/dm^2
admittance à 1.000 Hz	EOTA § 5.2.2.1.3.	EN 12373-5 : < 20 µS	< 20 µS
for a given thickness of 20 µm Stain test		EN 12373-4 < 2 on Qualanod scale	≤1

The fitness for use of this profile is evaluated through existing data.

Each batch of anodised profile has been submitted to initial tensile test and after ageing on each sealant for 17 years, or since the sealant is on the market.

In the framework of the ETA, the ETA holder has given the synthesis of these test results on a 5 years period.

The test method is as following:

- initial tensile test,
- tensile test after 7 days in water 23° C,
- tensile test after 7 days in oven 100° C.

All the test present a 100% cohesive rupture and X_{mean} > 0,84 MPa.

2.4.3 Glass product

2.4.3.1 Glass substrate

The suitable coated glass substrates are those declared in each structural sealant ETA.

2.4.3.2 Insulating glass unit

Due to the market organisation, the IGU cannot be identified in the framework of this ETA.

It is the task of the facadier (CE certificate holder) to verify case by case that the IGU complies with the relevant specification (EN 1279 and ETAG 002).

2.4.4 Compatibility – Effect of materials in contact

The compatibility between the following materials has been positively assessed.

	DC 993	**DC 895**	**VEC 99**	**VEC 90**	**DC 3362**	**Proglaze II**	**Proglaze 580**	**JS 562**
215-057	X	X	X	X	X	X	X	X

2.4.5 Mechanical devices

2.4.5.1 Mechanical self weight support

The mechanical self weight support ref. 256-012 has been tested.

The maximum load capacity is 365 N to limit the deflexion to 0,5 mm (ETAG 002 § 6.1.4.3.1), for a length of 100 mm.

2.4.5.2 Retaining devices

Reference: 256-012-1, 256-012-2 and 256-013.

No performance determined.

Depending on national regulation:

- Calculation can be performed case by case.
- The retaining devices can be designed and tested to comply with internal safety impact resistance requirement.

2.4.6 Impact test

No performance determined.

2.4.7 Sill height

The sill height can be adapted to any required height.

2.4.8 Wind resistance

No performance determined.

For example, sample frame H = 3 400 mm x L = 2 400 mm with an opening frame h = 2 448 mm x l = 2 947 mm can be resist a wind of increased pressure of 3 000 Pa according to EN 13830.

2.5 ER5 – Protection against noise

No performance determined.

2.6 ER6 – Energy, economy and heat retention

The calculation, if required, shall be performed case by case.

The thermal conductivities are declared in the ETA.