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## European Technical Assessment

**ETA 05/0005**  
of 02/07/2015

### GENERAL PART

<b>Technical Assessment Body issuing the ETE :</b> CSTB (Centre Scientifique et Technique du Bâtiment)	
<b>Trade name of the construction product</b>	TREMCO SG 490 (VEC 90) et TREMCO SG 499 (VEC 99)
<b>Product family to which the construction product belongs</b>	Structural sealant for use in structural sealant glazing systems
<b>Manufacturer</b>	TREMCO ILLBRUCK PRODUCTION SAS Route de Gray FR-21850 Saint Apollinaire
<b>Manufacturing plant(s)</b>	BLUESTAR SILICONES 55 rue des Frères Perret BP 22 FR-69191 SAINT-FONS Cedex
<b>This European Technical Assessment contains</b>	13 pages including 2 Annexes which form an integral part of this assessment.
	Annex(es) contain(s) confidential information and is/are not included in the European Technical Assessment when that assessment is publicly disseminated
<b>This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of</b>	ETAG 002, edition 2000, used as European Assessment Document (EAD)
<b>This ETA replaces</b>	ETA 05/0005, issued on 19/07/2010

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## SPECIFIC PART

### 1. Technical description of the product

The structural sealants TREMCO SG 490 (VEC 90) et TREMCO SG 499 (VEC 99) are silicone based sealants to be used in structural sealant glazing kit or system (SSGS) as defined in ETAG 002 for use as façade, roof glazing or part of it. The kit itself is not covered by this ETA.

Proprieties and characteristics of structural sealant:

Propriétés & Caractéristiques		TREMCO SG 490	TREMCO SG 499
Design stress in tension ( $\gamma_m = 6$ )	$\sigma_{des} =$	0,14 MPa	0,12 MPa
Design stress in tension ( $\gamma_m = 5$ )	$\sigma_{des} =$	0,17 MPa	0,14 MPa
Design stress in dynamic shear	$\tau_{des} =$	0,075 MPa	0,08 MPa
Elastic modulus in tension or compression tangential to the origin	$E_O =$	1,51 MPa	0,81 MPa
Elastic modulus in shear tangential to the origin	$G_O =$	0,50 MPa	0,27 MPa
Secant stiffness in tension at 12,5 % elongation	$K_{12,5} =$	1,98 MPa	1,75 MPa
Design shear stress under permanent load	$\Gamma_{\infty} =$	0,007 MPa	0,007 MPa
Resistance to tearing		0,66 catégorie d'utilisation 2	0,73 catégorie d'utilisation 2
Colour		noir	noir
Working time at 23°C 50% RH		6 min	2 min
Skin over time at 23°C 50% RH		6 min	2 min
Tack free time at 23°C 50% RH		20 min	3 min
Minimum time before transportation of the bonded frame		10 jours	1 ou 2 jours

## Complementary products of structural seal adhesion surface preparation

Cleaning product to be used:

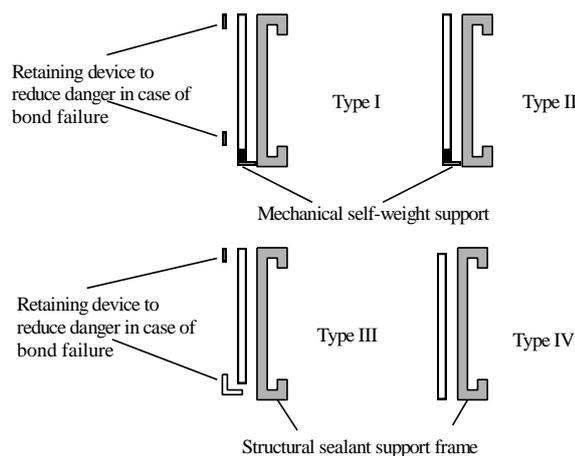
- On glass: alcohol (ethanol, propanol – 2).
- On anodised aluminium: MIBC (methylisobutylceton).

Primer to be used: 10073 from BLUESTAR SILICONES.

## 2. Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The structural sealants TREMCO SG 490 (VEC 90) et TREMCO SG 499 (VEC 99) are to be used in structural sealant glazing system (SSGS) to bond glazing products on metallic structural seal support frames. The suitable substrates are defined for each sealant in the present document.

The sealant TREMCO SG 490 is a single component sealant which can be used in types I to IV as per ETAG 002 SSGS table 1, while TREMCO SG 499 is a bi-component sealant which can be used in types I to IV as per ETAG 002 SSGS table 1.



The fitness for use of kits using this structural sealant shall be verified separately by means of a complementary ETA based on ETAG 002.

The essential requirements BWR2 Safety in case of fire, BWR 3 Hygiene, health and environment, BWR 4 Safety in use, BWR 6 Energy economy and heat retention shall be fulfilled, and failure of the structural bond would cause risk to human life and/or have considerable economic consequences.

The provisions made in this European Technical Evaluation are based on the assumed working life of the SSGS of 25 years. The assumed working life of a system cannot be taken as a guarantee given by the producer, but are to be used as a mean for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

### **3. Performance of the product and references to the methods used for its assessment**

The assessment of the fitness for use of the structural sealants for the intended use in relation to the requirements for safety in case of fire, hygiene, health and environment, safety in use, energy economy and heat retention in the sense of Essential Requirements 2, 3, 4 and 6 has been carried out in accordance with ETAG 002 – Part 1.

#### **3.1 Mechanical resistance and stability (BWR 1)**

Not relevant.

#### **3.2 Safety in case of fire (BWR 2)**

Reaction to fire: class F (No performance determined).

#### **3.3 Hygiene, health and the environment (BWR 3)**

Dangerous substances:

The manufacturer made a declaration of conformity to the Council Directive 76/769/EEC and its amendments.

In addition to the specific clauses relating to dangerous substances contained in this ETA, there may be other requirements applicable to the sealants (e.g. transposed European legislation and national laws, regulations and administrative provisions).

In order to meet the provisions of the EU Construction Product Directive, these requirements need also to be complied with, when and where they apply.

#### **3.4 Safety and accessibility in use (BWR 4)**

The characteristics of the sealants have been established on the basis of test results in accordance to chapter 5.1.4. of ETAG 002 section 1.

#### **3.5 Protection against noise (BWR 5)**

Not relevant.

#### **3.6 Energy economy and heat retention (BWR 6)**

Determination of thermal insulation and susceptibility to condensation: calculation method.

As a function of the design and the glazing chosen for the SSGS kits, thermal modelling can be undertaken with various computer software packages. To use the results of these programs, it is necessary to ensure that they are at least two-dimensional and cover all the required parameters.

The generally accepted value of the thermal conductivity ( $\lambda$ -value) of the structural sealant to be used in thermal modelling for assessment of the thermal performance is 0,35 W/(m.K) (EN 10456-06.2008).

#### **3.7 Sustainable use of natural resources (BWR 7)**

For sustainable use of natural resources no performance was investigated for this product.

### 3.8 Durability

Durability of fitness for use of TREMCO SG 490 (VEC 90) and TREMCO SG 499 (VEC 99) in structural seal:

All the specific aspects of durability have been covered. Under above headings, more particularly BWR4 SAFETY IN USE.

### 4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to Decision 97/556/EC (Decision of the Commission of 14 July 1997, L 229 of 20.8.1997, p. 15), as amended by Decision 2001/596/EC (Decision of the Commission of 8 January 2001, L 209 of 2.8.2001, p. 33)<sup>1</sup>, the systems of AVCP given in the following table apply:

Product	Intended use	System
Structural sealant	Kit Types II and IV	1
	Kit Types I and III	2+

The structural sealants can be used as components of any of SSGS kit I, II, III or IV. As a consequence, only system 1 applies.

Tasks and responsibilities are described in Annex 1.

### 5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at the CSTB.

The control plan is given in Annex 2.

Issued in Marne-la-Vallée

The original version is signed by

Charles BALOCHE, Technical Manager of the CSTB

<sup>1</sup> Decisions are published in the *Official Journal of the European Union (OJEU)*, see [www.new.eu-lex.europa.eu/oj/direct-access.html](http://www.new.eu-lex.europa.eu/oj/direct-access.html).

## Responsibilities

System of attestation of conformity 1 according to Council Directive 89/106/EEC Annex III laid down by the European Commission provides :

### 1) Task for the manufacturer

- a. factory production control,
- b. testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan.

### 2) Task for the approved body

- a. Initial type testing of the product.
- b. Initial inspection of the factory and factory production control.
- c. Continuous surveillance, assessment and approval of the factory production control.

## 1. Tasks of the manufacturer, factory production control

### 1.1 Factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. The production control system ensures that the product is in conformity with the European Technical Assessment.

The incoming materials are subjected to controls and tests by the manufacturer before acceptance according to a prescribed test plan.

The manufacturer proceeds to controls during the production according to specific policies. Those controls include :

TREMCO SG 490	TREMCO SG 499
Uncured product: - Visual control (aspect)	Uncured product: - Visual inspection (aspect) - Boeing flow test jig
On 6 mm plots : - Shore A hardness after 7 days.	On 6 mm plots – mixed components: - Shore A hardness after 7 days
On glass/glass samples : initial conditions – after immersion – after heat treatment:  - Modulus at 50% elongation - Stress at rupture - Elongation at rupture - Type of rupture.	On glass/glass samples : initial conditions – after immersion – after heat treatment:  - Modulus at 50% elongation - Stress at rupture - Elongation at rupture - Type of rupture.

<b>STRUCTURAL SEALANT</b>	<b>ANNEX 1 (1/3)</b> of ETA-05/0005
<b>Tasks and responsibilities</b>	

## **1.2 Testing of samples taken at the factory – prescribed Test Plan**

The results of factory production control are recorded and evaluated. The records include at least the following information :

- Designation of the product,
- Batch number,
- Type of testing,

Results of testing and comparison with the requirements.

<b>STRUCTURAL SEALANT</b>	<b>ANNEX 1 (2/3)</b> of ETA-05/0005
<b>Tasks and responsibilities</b>	

## **2. Tasks of notified bodies**

### **2.1 Initial type test**

For initial type testing, the results of the tests performed as part of the assessment for the European Technical Evaluation shall be used unless there are changes in the production line or plant. In such cases, the necessary initial type testing has to be agreed between the Centre Scientifique et Technique du Bâtiment and the notified body involved.

### **2.2 Initial inspection of the factory and factory production control**

The approved body shall ascertain that, in accordance with the prescribed test plan, the factory and the factory production control are suitable to ensure continuous and orderly manufacturing of the sealant according to the specification given in chapter 2.1 of the ETA.

### **2.3 Continuous surveillance**

The approved body shall visit the factory twice a year.

It has to verify the continuing conformity to the ETA taking into account the prescribed test plan.

This continuous surveillance is performed as per ETAG 002 § 8.3.

### **2.4 Certification**

When all criteria for conformity attestation are fulfilled, the notified body shall issue a certificate of conformity with this ETA (for System 1).

## **3. CE marking**

The CE marking shall be affixed on each cartridge or packaging of sealant. The symbol "CE" shall be accompanied by the following information:

- Name of identifying mark of the producer and plant.
- Identification number of the approved body.
- Identity of the product (commercial name).
- ETA number.
- Number of EC certificate of conformity.
- DoP
- ETAG 002 (edit 2000) reference

<b>STRUCTURAL SEALANT</b>	<b>ANNEX 1 (3/3)</b> of ETA-08/0286
<b>Tasks and responsibilities</b>	

## 1. Manufacturing

The sealants are manufactured by BLUESTAR SILICONES (FR-Saint Fons) in accordance to the provisions of the European Technical Assessment using a specific manufacturing process as identified during inspection of the plant by the Centre Scientifique et Technique du Bâtiment and the approved body and laid down in the technical document.

The maximum delay of use of sealant after the manufacturing is as following:

- TREMCO SG 490: 18 months.
- TREMCO SG 499/A: 18 months.
- TREMCO SG 499/B: 18 months.

## 2. Installation

### 2.1 Design rules of the sealant

The section of the structural sealant bead is calculated in accordance to ETAG 002-1 annex 2 where W is defined in national design codes.

The maximum thickness of seal for TREMCO SG 490 and TREMCO SG 499 in case of unsupported glazing is 9 mm.

### 2.2 Suitable substrates for structural adhesion surface

The suitable substrates are given hereafter: The uncoated soda-lime glass was verified to be suitable substrate for structural adhesion.

Float glass conforming to EN 572 "Glass in Building Basic Products", Part 1, 2, 4, 5 and possibly Thermally treated glass (conform to EN 1863 "Glass in Building - Heat Strengthened Glass" and EN 12150 "Glass in Building – Thermally Strengthened Safety Glass).

The assessment of the other suitable coating has been made on the basis of existing test reports. Yearly reviewed and confirmed with a large experience on site. The allowed coated glass with further testing are :

<b>STRUCTURAL SEALANT</b>	<b>ANNEX 2 (1/5)</b> of ETA-05/0005
<b>Assumptions under which the fitness of the product(s) for the intended use was favourably assessed</b>	

Society	Product	Cleaning product	TREMCO SG 490	TREMCO SG 499
AGC	PLANIBEL Clear Clearvision Dark Blue Privablue Bronze Green Grey Azur	Propanol-2	Yes with primer 10073 (SG073)	yes
	SUNGREY : Clear Grey Green Dark Blue Azur	Propanol-2	Yes with primer 10073 (SG073)	yes
	STOPSOL SILVER LIGHT Privablue	Propanol-2	Yes with primer 10073 (SG073)	yes
	STOPSOL CLASSIC Clear Grey Green Bronze	Propanol-2	Yes with primer 10073 (SG073)	yes
	STOPSOL SUPERSILVER : Clear Grey Green Dark Blue	Propanol-2	Yes with primer 10073 (SG073)	yes
GUARDIAN LUXGUARD	SUNGARD SOLAR : Neutral 67 Light Blue 52 Silver Grey 32 Rayol Blue 20 Silver 20 Silver 08 Bright Green 20 Bronze 20 Green 54 Green 42 Green 26 Aquamarine 18 Green 17 Green 07	Propanol-2	yes	yes
<b>STRUCTURAL SEALANT</b>			<b>ANNEX 2 (2/5)</b> of ETA-05/0005	
<b>Assumptions under which the fitness of the product(s) for the intended use was favourably assessed</b>				

Society	Product	Cleaning product	TREMCO SG 490	TREMCO SG 499
GUARDIAN LUXGUARD	SUNGARD HIGHT PERFORMANCE : Light Blue 62/52 Neutral 60/40 Neutral 61/42 Neutral 52/41 Neutral 50/32 Silver 43/31 Neutral 41/33 Royal Blue 38/31 Royal Blue 41/29 Amber 41/29 Bright Green 40/29 Bronze 40/27 Silver 35/26 Green 62/34 Green 50/32 Green 48/27 Green 42/27 Green 49/28 Green 40/23 Green 34/21 Green 33/22 Aquamarine 33/20 Green 28/18	Propanol-2	yes	yes
	CLIMAGUARD D CLIMAGUARD Neutral 70	Propanol-2	Yes with primer 10073	Yes with primer 10073
SAINT- GOBAIN GLASS	COOL LITE ST120 COOL LITE ST 150 COOL LITE Extrem	Propanol-2	yes	yes
	PLANIHERM Ultra N MIRASTAR VISION LITE REFLECTASOL Clear ECOLOGIC	Propanol-2	yes	yes
	ANTELIO Argent ANTELIO Clair ANTELIO Havane	Propanol-2	Yes with primer 10073 (SG073)	yes
<b>STRUCTURAL SEALANT</b>			<b>ANNEX 2 (3/5)</b> of ETA-05/0005	
<b>Assumptions under which the fitness of the product(s) for the intended use was favourably assessed</b>				

For any other substrate, the evaluation shall be performed by reference to ETAG 002-1 § 5.1.4 and has to be certificated by an approved body.

For particular substrate included in a generic family, the evaluation rules are given in ETAG 002-1 § 5.1.3. The coated glass has to comply with the requirements of ETAG 002 § 5.2.3.3, if not it must be totally removed from the structural adhesion surface.

### 2.3 Design of Structural Sealant Glazing System

Water stagnation is not allowed in the vicinity of the structural seal. The SSGS shall be designed to provide sufficient drainage and ventilation around the sealant section.

The SSG system shall be designed to allow the realisation of a regular, rectangular structural sealant bead without insert nor discontinuous substrate.

### 2.4 Application of the sealant

The ETA applicant provides to his clients a complete procedure for the bonding and specifications for installation including the following conditions:

- Temperature of application at least 15°C in a workshop, in a dust free location.
- The substrates shall be free from superficial condensation.
- Procedure for cleaning the substrates.
- Procedure for application of the primer when necessary.
- Application of the sealant itself.
- Storage: the bonded frame can be stored horizontally.
  - o TREMCO SG 490: 7 days minimum.
  - o TREMCO SG 499: 24 hours minimum.

### 2.5 Recommendation for façade cleaning product

It is recommended to use the following product for facades cleaning.

- Extran® MA02 Neutral – Origin MERCK dilution 2%.

Nevertheless, the assessment of the façade cleaning agent must be done in the framework of the ETA for the kit to check compatibility aspect with other components..

### 2.6 Chemical compatibility

The chemical compatibility has been favourably assessed for both sealants with the following components:

- Norton V2100 supplier TREMCO ILLBRUCK SAS.
- Norton V2200 supplier TREMCO ILLBRUCK SAS.
- TREM 151 supplier TREMCO ILLBRUCK SAS

<b>STRUCTURAL SEALANT</b>	<b>ANNEX 2 (4/5)</b> of ETA-05/0005
<b>Assumptions under which the fitness of the product(s) for the intended use was favourably assessed</b>	

## 2.7 Responsibility of the ETE holder

It is the responsibility of the ETE holder to ensure that the information on the related component requirements and their fabrication and setting is given to the person concerned. This information may be made by reproduction of the relevant parts of the European Technical Assessment.

## 2.8 Distribution

The sealants is put on the market under the following condition:

Supplier	Trade names
TREMCO ILLBRUCK PRODUCTION SAS	TREMCO SG 490
	TREMCO SG 499

### STRUCTURAL SEALANT

**Assumptions under which the fitness of the product(s) for the intended use was favourably assessed**

**ANNEX 2 (5/5)**  
of ETA-05/0005