European Technical Assessment

ETA 15/0759
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UBAtc Assessment Operator:
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**Technical Assessment Body issuing the European Technical Assessment: UBAtc.
UBAtc has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)**

Trade name of the construction product:	IGS 3703E
Product family to which the construction product belongs:	9 - Sealant used in structural sealant glazing systems to bond glass onto metal
Manufacturer:	MOMENTIVE PERFORMANCE MATERIALS GmbH Kaiser Wilhelm Allee, Gebäude V7, D-51368 Leverkusen, Germany
Manufacturing plants:	MOMENTIVE PERFORMANCE MATERIALS SILICONES BV Bergen op Zoom, The Netherlands
Website:	www.momentive.com
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	ETAG 002, edition 1999 amended in 2012, used as European Assessment Document (EAD)
This European Technical Assessment contains:	7 pages, without annexes

European Organisation for Technical Assessment

Legal bases and general conditions

1 This European Technical Assessment is issued by UBAtc (Union belge pour l'Agrément technique de la construction, i.e. Belgian Union for technical Approval in construction), in accordance with:

- Regulation (EU) N° 305/2011[1] of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC
- Commission Implementing Regulation (EU) N° 1062/2013[2] of 30 October 2013 on the format of the European Technical Assessment for construction products
- Guideline for European technical approval 002 (ETAG), used as European Assessment Document (EAD)

2 Under the provisions of Regulation (EU) No 305/2011, UBAtc is not authorized to check whether the provisions of this European Technical Assessment are met once the ETA has been issued.

3 The responsibility for the conformity of the performances of the products with this European Technical Assessment and the suitability of the products for the intended use remains with the holder of the European Technical Assessment.

4 Depending on the applicable Assessment and verification of constancy of performance (AVCP) system, (a) notified body(ies) may carry out third-party tasks in the process of assessment and verification of constancy of performance under this Regulation once the European Technical Assessment has been issued.

5 This European Technical Assessment allows the manufacturer of the construction product covered by this ETA to draw up a declaration of performance for the construction product.

6 CE marking should be affixed to all construction products for which the manufacturer has drawn up a declaration of performance.

7 This European Technical Assessment is not to be transferred to other manufacturers, agents of manufacturers, or manufacturing plants other than those indicated on page 1 of this European Technical Assessment.

8 The European Technical Assessment holder confirms to guarantee that the product(-s) to which this assessment relates, is/are produced and marketed in accordance with and comply with all applicable legal and regulatory provisions, including, without limitation, national and European legislation on the safety of products and services. The ETA-holder shall notify the UBAtc immediately in writing of any circumstance affecting the aforementioned guarantee. This assessment is issued under the condition that the aforementioned guarantee by the ETA-holder will be continuously observed.

9 According to Article 11(6) of Regulation (EU) N° 305/2011, when making a construction product available on the market, the manufacturer shall ensure that the product is accompanied by instructions and safety information in a language determined by the Member State concerned which can be easily understood by users. These instructions and safety information should fully correspond with the technical information about the product and its intended use which the manufacturer has submitted to the responsible Technical Assessment Body for the issuing of the European Technical Assessment.

10 Pursuant to Article 11(3) of Regulation (EU) N° 305/2011, manufacturers shall adequately take into account changes in the product-type and in the applicable harmonised technical specifications. Therefore, when the contents of the issued European Technical Assessment do not any longer correspond to the product-type, the manufacturer should refrain from using this European Technical Assessment as the basis for their declaration of performance.

11 All rights of exploitation in any form and by any means of this European Technical Assessment is reserved for UBAtc and the ETA-holder, subject to the provisions of the applicable UBAtc regulations.

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13 Subject to the application introduced, this European Technical Assessment is issued in English and may be issued by the UBAtc in its official languages. The translations correspond fully to the English reference version circulated in EOTA.

14 This European Technical Assessment, ETA 15/0759, was first issued on 2 November 2015.

[1] OJEU, L 88 of 2011/04/04

[2] OJEU, L 289 of 2013/10/31

Technical Provisions

1 Technical description of the product

1.1 Characteristics of the products

1.1.1 General

This ETA is being issued for the products specified on the cover page on the basis of agreed data/information, deposited with the UBAtc, which identifies the products that have been assessed and judged. Changes to the product/production process, which could result in the deposited data/information being incorrect, should be notified to the UBAtc before the changes are introduced. The UBAtc will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment/alterations to the ETA, shall be necessary.

1.1.2 Structural sealant IGS 3703E

The characteristics of the product are the following:

- Design stress in tension: σ_{des} = 0,10 MPa
- Design stress in dynamic shear: τ_{des} = 0,10 MPa
- Elastic modulus in tension or compression tangential to the origin: E0 = 1,23 MPa
- Elastic modulus in shear tangential to the origin G0 = 0,41 MPa
- Working time (at 25°C, 50% R.H.): 20 minutes
- Tack-free time (at 25°C, 50% R.H.): 60 minutes

Table 1 – IGS 3703E: Sealant - Physical characteristics

Test	ETAG ref.	Result
Specific mass	5.2.1.1	V_{mean} = 1,53
Hardness A	5.2.1.2	49
Thermogravimetric analysis	5.2.1.3	Curve kept in the ETA technical file
Colour	5.2.1.4	Black

1.1.3 Ancillary products for structural seal adhesion surface preparation

For cleaning purposes:

- MEK(2-butanone)
- IPA (Isopropanol)

2 Specification of the intended use(s) in accordance with the applicable EAD

2.1 General

Structural sealant IGS 3703E is a silicone based sealants intended to be used in structural sealant glazing system (SSGS) to bond glazing products on metallic structural seal support frames. Suitable substrates are defined for each sealant in the present ETA § 2.3.1.2.

Sealant IGS 3703E is a single component sealant which can be used in structural glazing systems types I or II as per ETAG 002 SSGS table 1.

The essential requirements ER2 Safety in case of fire, ER3 Hygiene, health and environment, ER4 Safety in use, ER6 Energy economy and heat retention shall be fulfilled. Failure of the structural bond might cause risk to human life and/or have considerable economic consequences.

The provisions made in this European Technical Assessment are based on the assumed working life of the SSGS of 25 years[3].

2.2 Provisions related to manufacturing, packaging and storage

The IGS 3703E is manufactured and packaged by MOMENTIVE PERFORMANCE MATERIALS SILICONES BV in Bergen op Zoom, the Netherlands.

The total shelf life of the sealant is 13 months after the fabrication date in its original unopened packaging, when stored below 27°C.

2.3 Provisions related to the design and use of the product

2.3.1 Design rules

2.3.1.1 Structural seal design

See method of calculation in ETAG 002

2.3.1.2 Suitable substrates for structural adhesion surface

The generic types of suitable adhesion substrates are being specified as a function of the structural sealant only as indication.

The generic types of suitable substrates for adhesion to the IGS 3703E sealant are:

- The float glass conform to EN 572 Glass in Building - Basic Products - Part 1,2,4,5 and the thermally treated glass made from, conform to
- EN 1863, Glass in building - Heat strengthened glass
- EN 12150, Glass in building - Thermally toughened safety glass
- The coated glass if compliance with the requirements of the ETAG 002 § 5.2.3.3. is demonstrated, if not, it must be totally removed from the structural adhesion surface.
- Anodized aluminium

[3] The indications given as to the working life of the products cannot be interpreted as a guarantee given by the ETA-holder or the assessment body. It should only be regarded as a means for specifiers to choose the appropriate criteria for this product in relation to the expected, economically reasonable working life of the works.

Except for the float glass, the combination of a specific substrate and sealant IGS 3703E shall be assessed in the framework SSGS ETA by passing the following set of tests by reference to the ETAG 002, § 5.1.4.1.1, 5.1.4.2.1, 5.1.4.2.2, 5.1.4.2.3, 5.1.4.2.4, 5.1.4.2.5.

In addition this particular substrate for structural seal adhesion surface has to be identified and assessed as per the relevant § of the chapter 5 and 6 of the ETAG 002.

2.3.1.3 Drainage and ventilation

Water stagnation is not allowed in the vicinity of the structural seal. Therefore, SSGS shall be designed with an efficient water tightness assisted by drainage and ventilation or by the absence of any void or cavity close to the IG seal.

2.3.1.4 Transfer of the infill loading on the building structure via the structural sealant

IGS 3703E is suitable to be used in SSGS type I or II as defined in ETAG 002. This means that the SSGS shall be equipped with mechanical self-weight devices in order to transfer the dead load of the glass to the façade structure.

2.3.1.5 Resistance to tearing

IGS 3703E sealants are category 1 sealant according ETAG 002 § 6.1.4.6.4 and inserts in the sealant joint are allowed.

2.3.2 Application of the sealant

2.3.2.1 Description of the structural sealant application

European Technical Assessments for structural sealant glazing kits shall specify the sealant application; in particular, the ETA shall specify the cleaning product to be used as well as the primer, if required, and the method of application.

2.3.2.2 General technical conditions

IGS 3703E sealant has to be prepared and applied between 10 and 35°C in a dust free location. The seal needs to be tooled before the skin-over time has been reached, preferably within 10 minutes after the extrusion. It is important to realise that the skin-over time can vary with temperature and relative humidity.

After the skin-over time has been reached, there should be no further relative movement induced between the glass and the metal frame.

Apply the sealant by pushing the bead ahead of the nozzle and making sure that the entire cavity is filled. Tooling should be done neatly, forcing the sealant into contact with the sides of the joint, thus helping to eliminate any internal voids and assuring good substrate contact. AIR POCKETS OR VOIDS WITHIN THE STRUCTURAL CAVITY ARE NOT ACCEPTABLE.

Sealant application is not recommended if moisture is present on the surfaces to be sealed.

Due to the smooth consistency of IGS 3703E, tooling agents such as water, soap or detergent solutions are not necessary or recommended. Dry tooling is recommended.

2.3.2.3 Surface Preparation

Sealants may not adhere or maintain long-term adhesion to substrates if the surface is not prepared and cleaned properly before sealant application. Using proper materials and following prescribed surface preparation and cleaning procedures is vital for sealant adhesion. Momentive Performance Materials GmbH can provide quality control information and suggestions to users upon request.

2.3.2.4 Materials

- Use clean, fresh solvent as recommended by the sealant manufacturer's test report. When handling solvents, refer to manufacturer's MSDS for information on handling, safety and personal protective equipment.
- MEK (2-butanone) and IPA (isopropyl alcohol) are commonly used and have proven useful for most substrates encountered in SSG systems. Xylene and Toluene have also been found useful on many substrates. Do not use Denatured Alcohol. Denatured Alcohol is not suggested because of the variability of additives, which may or may not provide reproducible results.
- Use only clean 99.9% pure industrial grade solvents. Do not use diluted solvents.
- Use clean, white cloths free of lint or other lint-free wiping materials.
- Use a clean, narrow-blade tooling knife when tooling structural silicone into the cavity.
- Use primer when required

2.3.2.5 Transportation

Transportation of the bonded units is allowed if the following two conditions are respected (see ETAG Table 10 Checks during the production): the tested H-samples give a 100% cohesive rupture and a breaking stress ≥ 0,7 MPa.

2.3.3 Recommendation for façade cleaning

It is recommended to use the following product for façade cleaning: Cleaning agent EXTRAN 02 Neutral MERCK dilution 5% -in water

Nevertheless, the assessment of the façade cleaning product must be done in the framework of the ETA for the kit in order to check that those cleaning agents do not affect other kit products (gaskets, weather sealant, ….).

2.3.4 Chemical compatibility

The chemical compatibility has to be assessed in the framework of the ETA for the structural sealant glazing kit as required by the ETAG 002 SSGS, § 5.1.4.2.5.

In the assessment procedure of the present ETA, the following combinations of products have been evaluated as satisfactory.

- Spacer tape: Norton V2100 and VITO Glazingmount 400
- Setting block: Silicone 75 Shore A
- Weatherseal: Silpruf and Silpruf NB

2.3.5 Responsibility of the manufacturer

It is the responsibility of the ETA holder to ensure that the information on the sealant characteristics and on the sealant extrusion is given to the person(s) concerned. This information may be provided by reproduction of the relevant parts of this European Technical Assessment.

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

The assessment of the fitness for use of the structural sealant for the intended use in relation to the requirements for safety in case of fire; safety in use; hygiene health and environment; energy economy and heat retention; in the sense of the Essential Requirements 2, 3, 4 and 6, has been made in accordance with the "Guideline for European Technical Assessment for Structural Sealant Glazing Systems (ETAG 002).

Where the guideline allows for classifications and/or choice, the selection specified below has been made.

ER2 Safety in case of fire

The behaviour in case of fire has to be assessed in the framework of the ETA for the structural sealant glazing kit

ER3 Hygiene, health and environment

In matter of "Dangerous substances", the sealant manufacturer made a declaration of conformity to the Council Directive 76/769/EEC published in "Official Journal of the European Communities" of 27/07/1976 and its amendments.

ER4 Safety in use

The product has been successfully subjected to the following tests, which are relevant for sealant: 5.1.4.1.1, 5.1.4.1.2, 5.1.4.2.1, 5.1.4.2.2, 5.1.4.2.3, 5.1.4.2.4, 5.1.4.2.5, 5.1.4.6.1, 5.1.4.6.2, 5.1.4.6.3, 5.1.4.6.4, 5.1.4.6.5, 5.1.4.6.7, 5.2.1.1, 5.2.1.2, 5.2.1.3, 5.2.1.4, with reference to ETAG 002

ER6 Energy economy and heat retention

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 may be undertaken with various computer software packages. To use the results of these programmes, 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 (λ-value) of the structural sealant to be used in thermal modelling for assessment of the thermal performance is 0,35 W/m K (EN ISO 10456).

Durability

The durability of the fitness for use of the structural sealants in structural bond has been demonstrated as follows:

All the specific aspects of durability have been covered under the headings above, more particularly ER4 Safety in use.

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

In accordance with Regulation (EU) N° 305/2011, Article 65, Directive 89/106/EEC is repealed, but references to the repealed Directive shall be construed as references to the Regulation.

The systems of assessment and verification of constancy of performance specified by the European Commission detailed in EC Decision 96/582/EC[4] are as follows:

- System 1 (without audit testing of samples) for SSG kits Type II and IV;
- System 2+ (first possibility, including certification of the factory production control (FPC) by an approved body on the basis of its continuous surveillance, assessment and assessment) for SSG kits Type I and III

The system(s) of assessment and verification of constancy of performance are shown in the following Table.

Table 2 – System(s) of assessment and verification of constancy of performance

Product(s)	Intended use(s)	Level(s) or class(es)	Assessment and verification of constancy of performance system(s)*
Structural sealant glazing kits type II and IV	External walls and roofs	none	1
Structural sealant glazing kits type I and III		none	2+

* See Annex V to Regulation (EU) N° 305/2011

The structural sealant being a component put on the market as such, it is impossible to determine in advance the Type of the kits in which the sealant is to be used. As a consequence, only system 1 applies.

[4] Commission decision of 24/06/96, published in the EC Official Journal L254 of 08/10/96

5 Technical details necessary for the implementation of the AVCP system

5.1 Tasks for the ETA-holder

5.1.1 Factory production control (FPC)

5.1.1.1 General

The manufacturer shall establish, document and maintain a FPC system to ensure that the products placed on the market conform to the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

A FPC system conforming with the requirements of EN ISO 9001, and made specific to the requirements of this ETA, is considered to satisfy the above requirements.

The results of inspections, tests or assessments requiring action shall be recorded, as shall any action taken. The action to be taken when control values or criteria are not met shall be recorded.

5.1.1.2 Equipment

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

5.1.1.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their conformity.

5.1.1.4 Non-conforming products

In the event of any non-conformity of any product, that product shall be placed into quarantine and action taken to rectify the cause of the non-conformity. Products may not subsequently be dispatched until the problem has been resolved.

5.1.1.5 Tests and frequencies

All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Assessment (ETA).

The FPC involves the following tests: Appearance, flow, specific gravity, application rate, curing, hardness, elongation at break, tensile at break, modulus at 50% and 100% elongation, peel adhesion and cohesive failure.

In the context of structural sealants, it is necessary for the manufacturer to undertake adhesion/cohesion tests to rupture after thermal conditioning as described in ETAG 002 §8.3.2.4, checks on incoming material (i) and on each batch of sealant. The testing of "H" pieces, peel tests, as part of FPC provides the necessary evidence.

5.2 Tasks for the Technical Assessment Body

5.2.1 Initial Type Testing

Assessment tests on the sealant have been conducted under the responsibility by the assessment body (UBAtc) in accordance with Chapter 5 of the ETAG 002. The assessment body (UBAtc) has assessed the results of these tests in accordance with Chapter 6 of this ETAG, as part of the ETA issuing procedure. These tests should be used for the purposes of Initial Type Testing.

As required by the System 1, this work is to be validated by the assessment body for Certification of Conformity purposes.

5.2.2 Assessment of the factory production control - Initial inspection and continuous surveillance

Assessment of the FPC is the responsibility of a Notified Body

An assessment shall be carried out on the required manufacturing steps of each manufacturing plant to demonstrate that the factory production control is in conformity with the ETA and any subsidiary information. This assessment is based on an initial inspection of the factory.

Subsequently continuous surveillance of factory production control is necessary to ensure continuing conformity with the ETA. This continuous surveillance is performed as per ETA § 5.1.1

It is recommended that surveillance inspections should be conducted at least twice a year.

6 Bibliography

ETAG 002 Structural sealant glazing kits Edition November 1999 1st amendment: October 2001- 2nd amendment: November 2005 - 3rd amendment: May 2012.

EN 572-1, -2, -4 and -5 Glass in building - Basic soda lime silicate glass products

EN 1863-1 and -2 Glass in building - Heat strengthened soda lime silicate glass

EN 1279-4 Glass in building - Insulating glass units - Part 4: Methods of test for the physical attributes of edge seals

EN 12150-1 and -2 Glass in building - Thermally toughened soda lime silicate safety glass

EN ISO 9001 Quality management systems - Requirements (ISO 9001:2015)

EN ISO 10456 Building materials and products - Hygrothermal properties -Tabulated design values and procedures for determining declared and design thermal values

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This European Technical Assessment has been issued by UBAtc asbl on the basis of the technical work carried out by the Assessment Operator, BCCA.

On behalf of UBAtc asbl,	On behalf of the Assessment Operator, BCCA, responsible for the technical content of the ETA,
Peter Wouters, Director	Benny De Blaere, Director general

The most recent version of this European Technical Assessment may be consulted on the UBAtc website (www.ubatc.be).