UBAtc
Union belge pour l'Agrément technique de la construction

member of EOTA and UEAtc

European Technical Assessment

ETA 03/0003
Version 01
Date of issue: 2017-05-23

UBAtc Assessment Operator:
Belgian Construction Certification Association
Rue d'Arlon 53 - 1040 Brussels
www.bcca.be - info@bcca.be

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:	DOW CORNING 3362 AND 3362 HD BLACK – GREY – WHITE
Product family to which the construction product belongs:	9 - Structural sealant for use in structural sealant glazing kit
Manufacturer:	DOW CORNING Parc Industriel Zone C B 7180 SENEFFE Belgium
Manufacturing plant:	DOW CORNING SENEFFE (Belgium) DOW CORNING GmbH WIESBADEN (Germany)
Website:	http://www.DowCorning.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 version replaces:	European Technical Approval 03/0003, issued on 6 April 2012
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.
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14. This European Technical Assessment, ETA 03/0003, was first issued on 23 May 2017 and replaces European Technical Approval, ETA 03/0003, issued on 06 April 2012.

[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 product

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 for glazing kit

The insulating glass unit edge seal sealant Dow Corning 3362 and 3362 HD are silicone based bi-component sealants,

1.1.3 Intended use

The insulating glass unit edge seal sealant Dow Corning 3362 and 3362 HD are used as outer edge seal for structural and non-structural Insulating Glass unit used in structural sealant glazing system (SSGS) in compliance with EN 1279 and the ETAG 002 dedicated to structural glazing systems types I and II as per ETAG 002 SSGS table 1.

The suitable substrates are defined in this ETA, clause 2.3.2.

1.1.4 Structural sealant DC 3362

The characteristics of the product are the following:

- Design stress in tension: σ_{des} = 0,14 MPa
- Design stress in dynamic shear: τ_{des} = 0,11 MPa
- Elastic modulus in tension or compression tangential to the origin: E_0 = 2,40 MPa
- Elastic modulus in shear tangential to the origin G_0 = 0,80 MPa
- Working time (at 25°C, 50% R.H.) : 10 minutes
- Tack-free time (at 25°C, 50% R.H.) : 30-45 minutes
- Water vapour permeability (EN 1279-4, Annex C) : 20 g per m² and per day for 2 mm thickness
- Gas leakage rate (EN 1279-3): L_i = 9,9 $10^{-3}.a^{-1}$ (L_i<1,00% a^{-1})[3]
- Gas permeation rate: 1,13 g/(m²h) according to EN 1279-4

1.1.5 Structural sealant DC 3362 HD

The characteristics of the product are the following:

- Design stress in tension: σ_{des} = 0,14 MPa
- Design stress in dynamic shear: τ_{des} = 0,11 MPa
- Elastic modulus in tension or compression tangential to the origin: E_0 = 4,80 MPa
- Elastic modulus in shear tangential to the origin G_0 = 1,60 MPa
- Working time (at 25°C, 50% R.H.): 10 minutes
- Tack-free time (at 25°C, 50% R.H.): 30-45 minutes
- Water vapour permeability (EN 1279-4, Annex C) : 18 g per m² and per day for 2,1 mm thickness
- Gas permeation rate : 0,98 g/(m²h) according to EN 1279-4

Table 1 - Dow Corning DC 3362: Structural Sealant - identification characteristics

Property	ETAG clause	DC 3362	DC 3362 HD
Specific mass	5.2.1.1	V_{mean} = 1,36	V_{mean} = 1,46
Hardness A	5.2.1.2	At least 35 after 24 hrs	60 - at full polymerization
Thermo-gravimetric analysis	5.2.1.3	Curve kept in the ETA technical file	
Colour	5.2.1.4	Black to white and all grey scale in-between	Black to white and all grey scale in-between

1.1.6 Ancillary products for structural seal adhesion surface preparation

- Dow Corning R40 Cleaner
- Standard Insulating Glass washing machine cleaner.

[3] This is an indication that the sealant Dow Corning 3362 is potentially fit of use for gas filled IGU. The value L_i can only be determined on actual edge seal design and variable from edge seal design to edge seal design

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

2.1 General

Structural sealant is intended to be used in curtain walling for which requirements ER2 Safety in case of fire, ER3 Hygiene, health and environment, ER4 Safety in use, ER5 Protection against noise and ER6 Energy economy and heat retention may be fulfilled. The failure of the structural bond would cause risk to human life and/or considerable economic consequences.

The provisions made in this European Technical Assessment 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 means for selecting appropriate products.

2.2 Provisions related to manufacturing, packaging and storage

The Dow Corning 3362 and 3362 HD are manufactured and packaged by Dow Corning in Seneffe Belgium (for the base) and Wiesbaden Germany (for the catalyst).

The total shelf life of the sealant is 14 months after the fabrication date in its original unopened packaging, when stored below 30°C.

2.3 Provisions related to the design and use of the product

2.3.1 Design rules

2.3.1.1 In case of insulating glass unit edge seal having a structural function

See method of calculation in ETAG 002.

2.3.1.2 In case of insulating glass unit edge seal having no structural function

The height of the edge is to be determined according the EN 1279 series of standards (ETAG 002, chapter 5.0) on each edge seal design.

2.3.2 Suitable substrates for structural adhesion surface

2.3.2.1 Generic types of suitable substrates

The generic types of suitable substrates for adhesion to the structural sealants Dow Corning DC 3362 and DC 3362 HD are:

- The float glass conform to EN 572-1, -2, -4 and -5 and the thermally treated glass made from, conform to EN 1863-1 and -2 and EN 12150-1 and -2.
- The coated glass if compliance with the requirements of the ETAG 002, clause 5.2.3.3. is demonstrated, if not, it shall be totally removed from the structural adhesion surface.
- Anodized aluminium

2.3.2.2 Specific type of suitable substrates

The following specific types of coated glass substrates have been assessed in the framework of the present ETA by passing the following set of tests referenced in the ETAG 002, clauses 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 and 5.1.4.2.5. and conform to ETAG 002, clause 5.2.3.3

Table 2 - Specific type of suitable substrates

Specific type of substrates	DC 3362
Coated glass SOLARBEL SS 20 (AGC)	Suitable
Coated glass SGG COOL-LITE SS 108 (SGG)	Suitable
Coated glass SGG COOL-LITE PB 114 N (SGG)	Suitable
Coated glass Stopsol Classic (AGC)	Suitable
Coated glass Stopsol Phoenix (AGC)	Suitable
Coated glass Stopsol Supersilver (AGC)	Suitable
Coated glass Sunergy	Suitable

From the Table 2, suitable coated glass for structural adhesion can be extrapolated following the rule mentioned in the ETAG 002, clauses 5.2.3.3.3 and 5.2.3.3.4.

2.3.2.3 Drainage and ventilation

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

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

Under the scope of this ETA, the Dow Corning DC 3362 and DC 3362 HD are suitable to be used in SSGS type I or II as defined in ETAG 002. This means that the SSGS must be equipped with mechanical self-weight retention devices in order to transfer the dead load of the glass to the façade structure.

2.3.2.5 Resistance to tearing

DC 3362 and DC 3362 HD are category 1 sealant according ETAG 002, clause 6.1.4.6.4 and inserts in the sealant joint are allowed.

2.3.2.6 Chemical compatibility

The chemical compatibility has to be assessed in the framework of the ETA for system as required by the ETAG 002, clause 5.1.4.2.5.

In the assessment procedure of the present ETA, the following products combinations were evaluated as required:

The Dow Corning 3362 Insulating Glass sealant is compatible with the Dow Corning DC 993, DC 797, DC 895, DC 991, DC 995 and DC 791.

2.3.2.7 Recommendation for façade cleaning

It is recommended to use the following product for façade cleaning:

Cleaning agent EXTRAN 02 Neutral MERCK dilution 2%

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, ….).

2.3.3 Application of the sealant

2.3.3.1 Description of the structural sealant application

The ETA's for structural sealant glazing kits describe the sealant application, in particular, the ETA's give the cleaning product to be used as well as the primer, if needed, and method of application.

2.3.3.2 General technical conditions

The Dow Corning 3362 and 3362 HD glazing sealants have to be prepared and applied between 5 and 35°C in a dust free location. The seal needs to be tooled before the snap time has been reached, preferably within 10 minutes after the extrusion. It is important to realise that the snap time can vary with temperature and relative humidity. However it is strongly recommended not to apply the sealant below 15°C in order to avoid risks on surface condensation.

After the snap time has been reached, there can't be further relative movement induced between the glasses of the insulating unit.

The FPC criteria to take into account by the manufacturer of IGU used in structural application are the following:

- In case of IGU (insulating glass unit) without structural function, the hardness of the sealant must be min 30 SHORE A before transport.
- In case of IGU with structural function, the transportation of the insulating glass 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.

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

3.1 General

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.

3.2 ER2 Safety in case of fire

3.2.1 Reaction to fire

No performance assessed

3.2.2 Resistance to fire

No performance assessed

3.3 ER3 Hygiene, health and environment

3.3.1 Dangerous substances

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

3.4 ER4 Safety in use

The product has been successfully subjected to the following tests, which are relevant for sealant: ETAG 002, clauses 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 and 5.2.1.4.

3.5 ER5 Protection against noise:

No performance assessed

3.6 ER6 Energy economy and heat retention

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 silicone sealant to be used in thermal modelling for assessment of the thermal performance is 0,35 W/m K (EN ISO 10456).

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 3 – 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.

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.

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

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 of 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. The results of assessment testing shall be used by notified bodies (cf. Regulation (EU), Annex V, clause 1.6).

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 shall be in conformity with ETAG 002 SSGS, chapter 8 at each identified manufacturing plant.

It is recommended that surveillance inspections should be conducted at least twice a year at each identified manufacturing plant.

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, -3, -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 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,

Peter Wouters,
Director

On behalf of the Assessment Operator, BCCA, responsible for the technical content of the ETA,

Benny De Blaere,
Director general

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