

European Technical Assessment

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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:

FINEO Vacuum insulating glass unit

Product family to which the construction product belongs:

Glass

Manufacturer:

AGC Glass Europe
Avenue Jean Monnet 4
B-1348 Louvain-la-Neuve
Belgium

Manufacturing plant:

AGC Glass Europe Lodelinsart
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Website:

<http://www.agc-glass.eu>

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

European Assessment Document (EAD): 300021-00-0404

This European Technical Assessment contains:

6 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° 305/2011¹ 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° 1062/2013² of 30 October 2013 on the format of the European Technical Assessment for construction products
 - EAD 300021-00-0404
- 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.
- 12 Reproduction of this European Technical Assessment including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of UBAtc. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Assessment.
- 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 was first issued by UBAtc on 22 January 2022.

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, if so, whether further assessment/alterations to the ETA, shall be necessary.

1.1.2 Vacuum insulated glass FINEO

Product consisting of two panes of glass, separated by an array of spacer pillars and sealed along the periphery, whereby the space between the glass panes is evacuated to a pressure below 1 Pa (10^{-2} mbar).

The glass panes are specified by referring to the following standards EN 572-1, EN 572-2, EN 572-9, EN 1863-2, EN 12150-2, EN 12337-2 and EN 14179-2.

The coated glass panes, Advanced for FINEO, is part of this ETA and specified by referring to EN 1096-4. Their spectrometric characteristics are given in Table 2.

The edge seal is achieved by soldering the periphery of the glass panes with solder glass paste.

The distance between the panes is maintained using a spacer pillars array. The spacer pillars are distributed on the glass surface according a predefined pattern.

A getter is used to sorb residual gas from the vacuum space.

No evacuation port is visible on the Vacuum insulating glass units using AGC technology.

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

2.1 General

Vacuum insulating glass units are intended to be used as infill of elements of the building envelope, including both internal and external applications, e.g. infill of windows, doors, curtain walls and greenhouses.

The provisions made in this European Technical Assessment are based on the assumed working life of the SSGS of 10 years³.

2.2 Provisions related to manufacturing, packaging and storage

The VIG manufacturing process consists of several steps:

1. Preparation of Coated Glass pane
2. Preparation of clear glass pane
3. Placement of Pillars
4. Dispensing of the getter
5. Dispensing of the glass frit
6. Glass panes coupling
7. Sealing by thermal processing
8. Final product refining

The vacuum insulating glazing units are transported to customers on racks, when the dimensions allow, on standard carriages or in crates.

They are placed on or in their support with spacers to avoid glass-to-glass contacts.

They are packed in a protection depending on the destination.

2.3 Provisions related to the use of the product

2.3.1 Design and setting rules

According to the project's conditions, the vacuum insulating glass design shall take into account the following three types of loads:

- the loading due to the atmospheric pressure,
- the load due to the temperature gradient,
- the dead load and externally applied loadings as e.g. wind.

Each project is studied by AGC to define the adequate VIG configuration considering the setting rules.

2.3.2 Responsibility of the manufacturer

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

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.

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

The assessment of the FINEO Vacuum insulating glass units 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, has been made in accordance with EAD 300021-00-0404.

3.1 Safety in case of fire

The FINEO Vacuum insulating glass units satisfies the requirements for performance class A1 for reaction to fire, in accordance with the Commission Delegated Regulation (EU) 2016/364⁴, without the need for testing on the basis of it fulfilling the conditions set out in Commission Decision 96/603/EC⁵, as amended by Commission Decisions 2000/605/EC⁶ and 2003/424/EC⁷.

3.2 Mechanical behaviour of the VIG unit

3.2.1 Resistance to loads

The fitness for use and the composition of the FINEO Vacuum insulating glass units shall be examined on a case-by-case basis depending on the project conditions.

For the wind, snow, self-weight, horizontal line and point loads on glazed works acting as safety barriers, maintenance load, the equivalent thickness of the VIG to consider in the mechanical design is total thickness of the VIG unit (sum of the glass panes thicknesses and the thickness of the vacuum space).

The minimum compression breaking force is 90 N at initial state of the pillars, before VIG assembling.

The creep resistance of the pillars has been validated according to EAD 300021-00-0404, Annex 3, clause A3.2. The pillars were not affected by the creep resistance test.

3.3 Airborne sound isolation performances

The airborne sound isolation has been assessed in accordance with ISO 19916-1:2018, clause 8. The test results are given in the Table 1.

Table 1 – Airborne sound insulation performances

VIG Denomination	$R_{(w)}$ [dB]	$R_{(w)} + C$ [dB]	$R_{(w)} + C_{tr}$ [dB]
4()4	35	33	30
6()4	36	34	33
6()6	36	35	34

3.4 Thermal isolation performances

3.4.1 Coated glass

The coated glasses covered by this ETA are described in the Table 2 and have been characterised in accordance to EN 1096-1

Table 2 – Coated glass - Spectrometric and thermal characteristics

Characteristics	Coating Advanced for FINEO
Visible range	τ_v
	ρ_v
	ρ'_v
Solar range	τ_e
	ρ_e
	ρ'_e
Thermal range	$\epsilon_{n,d}$

3.4.2 Thermal transmittance and solar factor

The thermal transmittance and solar factor related to the glass composition are given the Table 3.

Table 3 – IGU – Thermal transmittance and solar factor

Characteristics	VIG FINEO Coating advance for FINEO
4()4	U_g
	$g \%$
6()4	U_g
	$g \%$
6()6	U_g
	$g \%$

3.5 Durability

3.5.1 Coated glass

The coated glass, Advanced for FINEO, is a coated glass type C evaluated according EN 1096-3.

The coated glass, Advanced for FINEO, has been assessed according the harmonised standard EN 1096-4.

3.5.2 Vacuum insulated glass units

The weathering resistance has been evaluated according to EAD 300021-00-0404, clause 2.2.8. The U-value did not change after the weathering resistance test.

The resistance to temperature gradient has been evaluated according to EAD 300021-00-0404, clause 2.2.9.

$$\Delta T_c = 3,19\%$$

⁴ OJEU, L 68, 15.3.2016, p. 4

⁵ OJEU, L 267, 19.10.1996, p. 23

⁶ OJEU, L258, 12.10.2000, p. 36

⁷ OJEU, L 144, 12.6.2003, p. 9

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.

For vacuum insulating glass units, the applicable European legal act is Commission Decision 2000/245/EC⁸ of 2 February 2000 on the procedure for attesting the conformity of construction products pursuant to Article 20(4) of Council Directive 89/106/EEC as regards flat glass, profiled glass and glass block products, amended by Commission Decision 2001/596/EC⁹ of 8 January 2001 and by Commission Delegated Regulation (EU) 2016/364¹⁰ of 1 July 2015 on the classification of the reaction to fire performance of construction products pursuant to Regulation (EU) No 305/2011¹¹ of the European Parliament and of the Council, as amended.

The system(s) of assessment and verification of constancy of performance are shown in the Table 4.

Table 4 – System(s) of assessment and verification of constancy of performance

Product(s)	Intended use(s)	Level(s) or class(es)	Assessment and verification of consistency of performance system(s)*
Vacuum insulating glass	For uses subject to reaction to fire regulations	A1, A2, B, C, D, E, F	3
		(A1 to F)*, NPD**	4
<p>* See Annex V to Regulation (EU) N° 305/2011</p> <p>* Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Class A1 according to Commission Decision 96/603/EC12).</p> <p>** 'No Performance Declared' in accordance with Regulation (EU) N° 305/2011, Article 6(f)</p>			

5 Technical details necessary for the implementation of the AVCP system

5.1 Tasks for the ETA-holder - Factory production control (FPC)

5.1.1 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.

5.1.2 Equipment

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

5.1.3 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.

5.1.4 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.

5.1.5 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).

5.2 Tasks for the Technical Assessment Body - Assessment of the performance of the construction product

Assessment tests VIG unit have been conducted under the responsibility of the assessment body (UBA^{tc}) in accordance with EAD 300021-00-0404.

These assessment results should be used for the purposes of assessment of the performance of the construction product in accordance with Regulation (EU) N° 305/2011, Annex V, clause 1.6.

⁸ OJEU, L 77, 28.3.2000, p. 13

⁹ OJEU, L 209, 2.8.2001, p. 33

¹⁰ OJEU, L 68, 15.3.2016, p. 4

¹¹ OJEU, L 88, 4.4.2011, p. 5-43

¹² OJEU, L 267, 19.10.1996, p. 23-26

6 Bibliography

The following documents, in whole or in part, are normatively referenced in this European Technical Assessment and are indispensable for its application.

EOTA TR021	Reaction to fire requirements for small components (June 2005)
EN 572-1	Glass in building - Basic soda lime silicate glass products — Part 1: Definitions and general physical and mechanical properties
EN 572-2	Glass in building - Basic soda lime silicate glass products — Part 2: Float glass
EN 572-9	Glass in building - Basic soda lime silicate glass products — Part 9: Evaluation of conformity/Product standard
EN 1096-1	Glass in building – Coated glass products – part 1
EN 1096-3	Glass in building – Coated glass products – part 3
EN 1096-4	Glass in building - Coated glass — Part 4: Evaluation of conformity/Product standard
EN 1863-2	Glass in building - Heat strengthened soda lime silicate safety glass — Part 2: Evaluation of conformity/Product standard

EN 12150-2	Glass in building - Thermally toughened soda lime silicate safety glass — Part 2: Evaluation of conformity/Product standard
EN 12337-2	Glass in building - Chemically strengthened soda lime silicate glass — Part 1: Evaluation of conformity/Product standard
EN 14179-2	Glass in building - Heat soaked thermally toughened soda lime silicate safety glass — Part 2: Evaluation of conformity/Product standard
EN 13501-1	Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests
ISO 19916-1	Glass in building - Vacuum insulating glass - Part 1: Basic specification of products and evaluation methods for thermal and sound insulating performance

This ETA is based on the reference documents specified in EAD 300021-00-0404. In case the publication of (a) new version(s) of these reference documents introduces a change that might influence the content of this ETA, the manufacturer should take the necessary actions to bring this ETA in line with this/these new version(s).

UBAtc asbl is a non-profit organization according to Belgian law. It is a Technical Assessment Body notified by the Belgian notifying authority, the Federal Public Services Economy, SMEs, Self-Employed and Energy, on 17 July 2013 in the framework of Regulation (EU) No 305/2011 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 and is member of the European Organisation for Technical Assessment, EOTA (www.eota.eu).

This European Technical Assessment has been issued, in Sint-Stevens-Woluwe, 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

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