

European Technical Assessment

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UBA_{tc} Assessment Operator



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Technical Assessment Body issuing the European Technical Assessment: UBA_{tc}.
UBA_{tc} 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:

Marmox® Thermoblock

Product family to which the construction product belongs:

Composite insulation masonry unit for base layer

Manufacturer:

Marmox Egypt
El Haram Street
EG-12121 Giza
Egypt

Manufacturing plant(s):

01

Website:

www.cmbegypt.com

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

European Assessment Document (EAD): EAD 170040-00-0305

This version replaces

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This European Technical Assessment contains:

9 pages



**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) No 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) No 1062/2013² of 30 October 2013 on the format of the European Technical Assessment for construction products.
 - European Assessment Document (EAD) : EAD-170040-00-0305.
- 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) No 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) No 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 was first issued by UBAtc on 29-04-2024.

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 General

Marmox® Thermoblock is factory-made thermally insulating and load-bearing masonry units made of insulation with concrete-filled holes and reinforced mortar layer(s) on the bed faces.

The products are manufactured by Marmox Egypt at production plant 01 (known by UBAtc).

1.2 Geometry and density

The geometry and density of Marmox® Thermoblock are given in Table 1.

Table 1 – Geometry and density of Marmox® Thermoblock

Characteristic	Evaluation method	Performance
Length (L)		615 mm
Width (w)	EN 772-16	90 mm, 100 mm, 140 mm, 150 mm, 175 mm, 190 mm, 214 mm, 240 mm or 290 mm
Height (h)		53 mm or 100 mm
Plane parallelism of the bed faces		NPA
Squareness	EN 824	$S_{1b} \leq 3 \text{ mm/m}$ $S_d \leq 2 \text{ mm}$
Flatness of the bed faces	EN 772-20	NPA
Density	EN 1602	300 kg/m ³

1.3 Ancillary products

Ancillary products referred to in this ETA, as a part of installation provisions or in the framework of determining performances (e.g. fire resistance), are not covered by this ETA and may not be CE-marked on the basis of it.

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

2.1 Intended uses

The product is used as base layer in masonry constructions to eliminate structural thermal bridging, reduce the risk of condensation and mould growth.

This EAD deals with the application as a thermal break in masonry walls. The masonry walls with the thermal break shall assure the stability in accordance with the EN 1996-1-1 and the energy performances to prevent heat losses and mould growth/surface condensation.

Both concerning design and installation, the use of the composite insulation masonry units is subject to the standards and regulations in force at the place of use.

The provisions made in this European Technical Assessment are based on the assumed working life of 50 years³.

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

2.2.1 Manufacturing directives

The European technical assessment is issued for the product on the basis of agreed data/information, deposited with the approved body, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to the approved body before the changes are introduced. The approved body 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 or alterations to the ETA, shall be necessary.

2.2.2 Design

In the design and the calculation of the ultimate stresses, the EN 1996-1-1 in local design requirements shall be respected.

2.2.3 Installation

The positioning of the Marmox® Thermoblock units shall respect the installation requirements of the manufacturer and be in conformity with the state of the art and good workmanship of building masonry walls, applicable in the country of use.

All masonry dilatation joints and other constructive joints shall be respected.

The Marmox® Thermoblock units are horizontally positioned one against the other in the mortar and slightly and gently pushed or knocked with a trowel until the mortar on all slides is flowing out and a perfect adhesion is reached.

Knocking or banging with the sharp edges of the trowel or other objects shall be avoided. The vertical joints in between the Marmox® Thermoblock units are closely positioned without mortar in between. As with all protected masonry, direct exposure to wetting and freeze/thaw cycling should be avoided.

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.

Upon the Marmox® Thermoblock units positioned as base layer in masonry walls, the first layer of bricks are fully placed into the mortar and shall be installed in such a way that the loads are uniformly spread over the surface.

2.3 Recommendations

2.3.1 Recommendations on packaging, transport and storage

The Marmox® Thermoblock units are packaged in boxes, transported and stored on pallets, to prevent damages from occurring.

2.3.2 Recommendations on use, maintenance and repair

Given that the Marmox® Thermoblock units layer is integrated into the masonry, no extra attention for maintenance or repair is necessary. Within the disposal and discharge treatment to thermal breaks may be considered on the basis of the same waste/reuse procedures as for the masonry elements.

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

3.1 Mechanical resistance and stability (BWR1)

3.1.1 Compressive strength of the composite insulation masonry unit

The mean compressive strength of 7,5 N/mm² is given with a probability of failure to reach it not exceeding 5% (masonry unit of category I (see definition in EN 771-1 to 6)).

When the Marmox® Thermoblock units are sampled from a consignment in accordance with EN 771-1 Annex A and tested in accordance with EN 772-1 with mortar capping, then:

- The mean compressive strength of the specified number of Marmox® Thermoblock units is not less than the result of the assessment (= 7,5 N/mm²);
- Individual strengths of specimens measured within the test sample shall not be less than 80 % of the result of the assessment (= 6,0 N/mm²).
- The coefficient of variation of the strength of the Marmox® Thermoblock units is not more than 25 %.

3.1.2 Compressive strength of the structural material

No performance assessed.

3.1.3 Eccentric loading behaviour

From the eccentric loading tests on Marmox® Thermoblock units according to EAD 170040-00-0305, Clause 2.2.3, it is concluded that the influence of eccentric loading may be determined assuming linear behaviour. As a result the capacity reduction factor shall be calculated as follows:

$$\phi = \frac{1}{1 + 4 \cdot \frac{e_t}{t}}$$

with:

- e_t : eccentricity.
- t : thickness.
- ϕ : capacity reduction factor.

3.1.4 Creep long term behaviour

No performance assessed.

3.1.5 Long term compressive strength of the composite insulation masonry unit

No performance assessed.

3.1.6 Compressive strength as part of masonry with a layer made out of composite insulation masonry units

The procedure described in the EN 1996-1-1+A1:2013, Clause 3.6.1.2 (1) (i) and the following masonry units and mortar types have been used during the assessment of mechanical performances.

The information given below is only valid for brick types, which are at least equivalent to the types given in the notes below the Table 2. For the use, the design and the installation of the thermal break, the design values of the mechanical strength shall further consider local specifications in force at the place of use.

Table 2 – Normalised compressive strength of masonry units (f_b) and compressive strength of the mortar (f_m) used during the assessment

Masonry Unit	f_b (N/mm ²)	General purpose mortar	f_m (N/mm ²)
Calcium Silicate units; Group 1*	20,0	M20	20
Clay units; Group 2**	15,0		

*: Solid blocks with volume of all holes $\leq 25\%$ and the volume of any hole $\leq 12,5\%$ (% of the gross volume)

**: Perforated clay blocks, for which the volume of the perforations is $> 25\%$ and $\leq 50\%$ (% of the gross volume), the volume of each of multiple holes $\leq 2\%$ (% of the gross volume), the volume of grip holes up to a total of $12,5\%$ (% of the gross volume), the combined thickness of webs and shells (volume of the overall width) $\geq 16\%$, and the thicknesses of the web $\geq 5\text{ mm}$ and shell $\geq 8\text{ mm}$

The compressive strength of masonry f_k with Marmox® Thermoblock units is specified in Table 3 where:

- $f_{\text{mean, tb}}$ is the mean compressive strength (50/95-value) of the thermal break units, in the direction of the applied action effect according to Clause 3.1.1, in N/mm².
- f_b is the normalised compressive strength of masonry units, in the direction of the applied action effect according EN 772-1 for the clay bricks and EN 771-2 for the calcium silicate units, in N/mm².
- f_m is the compressive strength of the mortar according EN 1015-11, in N/mm².
- f_k is the characteristic compressive strength of the masonry with the thermal break included according to EN 1052-1 in N/mm².

Table 3 – f_k of masonry with Marmox® Thermoblock with compressive strength $f_{\text{mean, tb}} = 7,5\text{ N/mm}^2$ (MPa)

Masonry Units	f_b (N/mm ²)	General purpose mortar	f_m (N/mm ²)	f_k (N/mm ²)
Calcium Silicate units; Group 1	$\geq 20,0$	M20	20,0	4,8
Clay units; Group 2	$\geq 15,0$			3,1

3.1.7 Shear strength as part of a masonry with a layer of composite insulation masonry unit

The initial shear strength of masonry f_{vk0} with Marmox® Thermoblock units and the characteristic value of the coefficient of friction μ' , are specified in Table 4 where:

- f_b is the normalized compressive strength of masonry units, in the direction of the applied action effect according to EN 771-1, in N/mm².
- f_m is the compressive strength of the mortar according to EN 1015-11 in N/mm².
- f_{vk0} is the characteristic initial shear strength of the masonry with the thermal break included according to EN 1052-3 in N/mm².
- μ' is the characteristic value of the coefficient of friction according to EN 1052-3.
- $f_{\text{mean, tb}}$ is the mean compressive strength (50/95-value) of the thermal break units, in the direction of the applied action effect according to EAD 170040-00-0305, in N/mm².

This value is only valid for short time loading.

Table 4 – f_{vk0} for Marmox® Thermoblock units with compressive strength $f_{\text{mean, tb}} = 7,5\text{ N/mm}^2$ (MPa)

Masonry Units	f_b (N/mm ²)	General purpose mortar	f_m (N/mm ²)	f_{vk0} (N/mm ²)	μ' (-)
Calcium Silicate units; Group 1	20,0	M20	20,0	0,18	0,20
Clay units; Group 2	15,0				

3.1.8 Tensile strength of the glass fibre mesh

The tensile strength of the glass fibre is $\geq 1300\text{ N/5cm}$ according to EN 13496.

3.2 Safety in case of fire (BWR2)

3.2.1 Reaction to fire

The Marmox® Thermoblock unit is classified class E according to EN 13501-1.

3.2.2 Propensity to undergo continuous smouldering

No performance assessed.

3.3 Hygiene, health and the environment (BWR3)

3.3.1 Dimensional stability at specified temperature and humidity

The relative changes in length, $\Delta\epsilon_l$, width, $\Delta\epsilon_b$, and thickness, $\Delta\epsilon_d$, after storage for 48 h at $(70 \pm 2)\text{ }^\circ\text{C}$ and $(90 \pm 5)\%$ relative humidity in accordance with EN 1604, do not exceed 0,5 %.

3.3.2 Water absorption by immersion – long term

The long-term water absorption by partial immersion, W_p , in accordance with EN ISO 16535, Method B, does not exceed $1,5\text{ kg/m}^2$.

3.3.3 Water absorption by capillarity

The water absorption by capillarity of the bed faces in accordance with EN 772-11 for an immersion time of $(10 \pm 0,2)\text{ min}$, does not exceed $0,01\text{ g/m}^2\text{s}$.

3.3.4 Water vapour resistance

No performance assessed.

3.3.5 Release of dangerous substances

No performance assessed.

3.4 Safety and accessibility in use (BWR4)

3.4.1 Geometry (length, width, thickness, plane parallelism, squareness and flatness)

Table 5 – Tolerance on the geometry of Marmox® Thermoblock

Characteristic	Evaluation method	Tolerance
Length (L)	EN 772-16	± 1 mm
Width (w)		± 1 mm
Height (h)		+2/-4 mm
Plane parallelism of the bed faces		NPA
Squareness	EN 824	-
Flatness of the bed faces	EN 772-20	NPA

3.4.2 Density of the composite insulation masonry unit

The gross dry density of the composite insulation masonry unit, determined according to EN 1602, is 300 kg/m³ (± 15 %).

3.4.3 Density of the structural material

The density of the structural material, determined according to EN 12390-7, is 1125 kg/m³.

3.4.4 Density of the mortar used in reinforced mortar layer

The density of the mortar used in reinforced mortar layer, determined according to EN 1015-10, is 1900 kg/m³.

3.4.5 Mass per unit area of the glass fibre mesh

The mass per unit area of the glass fibre mesh, determined according to EAD 040016-01-0404, is 110 g/m².

3.4.6 Thickness of the reinforced mortar layer

The thickness of the reinforced mortar layer, determined according to EAD 170040-00-0305, is 2 mm.

3.4.7 Mesh size of the glass fibre mesh

The mesh size of the glass fibre mesh, determined according to EAD 040016-01-0404, is 5 x 10 mm.

3.5 Protection against noise (BWR5)

3.5.1 Sound insulation

No performance assessed.

3.6 Energy economy and heat retention (BWR6)

3.6.1 Thermal resistance

The thermal conductivity of the structural material, $\lambda_{\text{concrete}}$, is 0,130 W/m.K according to EN 12667.

The thermal conductivity of the insulation, $\lambda_{\text{insulation}}$, is 0,030 W/m.K.

The thermal conductivity of the Marmox® Thermoblock unit, λ_{element} , is 0,047 W/m.K.

3.7 Sustainable use of natural resources

3.7.1 Durability

No performance assessed.

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, Directive 89/106/EEC is repealed, but references to the repealed Directive shall be construed as references to the Regulation.

For the products covered by this ETA the applicable European legal act is Commission Decision 1997/740/EC⁴ of the European Commission for masonry and related products, as amended. The systems to be applied for the products covered by this EAD have been specified in Table 6.

Table 6 – System of assessment and verification of constancy of performance applicable to products covered by this EAD

Intended use(s)	Level(s) or class(es)	AVCP system(s) ^a
	A1*, A2*, B*, C*	1
For uses subject to reaction to fire regulations	A1**, A2**, B**, C**, D, E, F	3
	(A1 to F)***, NPD****	4
Units with a specified mean compressive strength with a probability of failure to reach it not exceeding 5 %	-	2+

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

* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material).

** Products/materials not covered by footnote (*).

*** 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/EC).

**** 'No Performance Declared' in accordance with Regulation (EU) N° 305/2011, Article 6(f)

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

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.

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).

5.2 Tasks for the Technical Assessment Body

5.2.1 Initial Type Testing

Assessment tests on the product have been conducted under the responsibility by the Technical Assessment Body (UBAtc) in accordance with EAD 170040-00-0305.

UBAtc has assessed the results of these tests in accordance with EAD 170040-00-0305, as part of the ETA issuing procedure. In accordance with Regulation (EU) N° 305/2011, Annex V, 1.6, these tests should be used for the purposes of Initial Type Testing.

⁴: Commission Decision 97/740/EC of 14 October 1997 on the procedure for attesting the conformity of construction products pursuant to Article 20 (2) of Council Directive 89/106/EEC as regards masonry and related products (OJ L 299, 4.11.1997, p. 42)

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.

6 Bibliography


- EAD 040016-01-0404:2021 Glass fibre mesh for reinforcement of cementitious or cement based renderings
- EN 771-1:2011+A1:2015 Specification for masonry units – Part 1: Clay masonry units
- EN 771-2:2011+A1:2015 Specification for masonry units – Part 2: Calcium silicate masonry units
- EN 771-3:2011+A1:2015 Specification for masonry units – Part 3: Aggregate concrete masonry units (Dense and lightweight aggregates)
- EN 771-4:2011+A1:2015 Specification for masonry units – Part 4: Autoclaved aerated concrete masonry units
- EN 771-5:2011+A1:2015 Specification for masonry units – Part 5: Manufactured stone masonry units
- EN 771-6:2012+A1:2015 Specification for masonry units – Part 6: Natural stone masonry units
- EN 772-1+A1:2015 Methods of test for masonry units - Part 1: Determination of compressive strength
- EN 772-11:2011 Methods for test for masonry units – Part 11: Determination of water absorption of aggregate concrete, autoclaved aerated concrete, manufactured stone and natural stone masonry units due to capillary action and the initial rate of water absorption of clay masonry units
- EN 772-16:2011 Methods for test for masonry units – Part 16: Determination of dimensions
- EN 772-20:2000+A1:2015 Methods for test for masonry units – Part 20: Determination of flatness of faces of masonry units
- EN 824:2013 Thermal insulating products for building applications - Determination of squareness
- EN 1015-10:1999+A1:2006 Methods of test for mortar for masonry - Part 10: Determination of dry bulk density of hardened mortar
- EN 1015-11:2019 Methods of test for mortar for masonry - Part 11: Determination of flexural and compressive strength of hardened mortar
- EN 1052-1:1998 Methods of test for masonry - Part 1: Determination of compressive strength
- EN 1602:2013 Thermal insulating products for building applications - Determination of the apparent density
- EN 1604:2013 Thermal insulating products for building applications - Determination of dimensional stability under specified temperature and humidity conditions
- EN 1996-1-1:2005+A1:2012 Eurocode 6 - Design of masonry structures - Part 1-1: General rules for reinforced and unreinforced masonry structures
- EN 12667:2001 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance
- EN 12390-7:2019 Testing hardened concrete - Part 7: Density of hardened concrete
- EN 13164:2012+A1:2015 Thermal insulation products for buildings – Factory made extruded polystyrene foam (XPS) products – Specification
- EN 13496:2013 Thermal insulation products for building applications - Determination of the mechanical properties of glass fibre meshes as reinforcement for external thermal insulation composite kits with renders (ETIC kits)
- EN 13501-1:2018 Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests
- EN ISO 10211:2017 Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations
- EN ISO 10456:2007 Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values
- EN ISO 14683:2017 Thermal bridges in building construction - Linear thermal transmittance - Simplified methods and default values
- EN ISO 16535:2019 Thermal insulating products for building applications - Determination of long-term water absorption by immersion

NOTE: The editions of reference documents given above are those which have been adopted by the UBAtc for its specific use when establishing this ETA. When new editions become available, these supersede the editions mentioned only when confirmed by the UBAtc.

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 by UBAtc asbl, in Sint-Stevens-Woluwe, on the basis of the technical work carried out by the Assessment Operator, BCCA.

On behalf of UBAtc asbl,


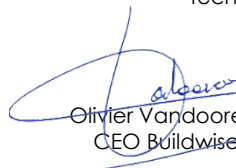


Eric Winnepeninckx
secretary general



Benny De Blaere,
director

On behalf of the Assessment Operator,
Buildwise and SECO Belgium, responsible for the
technical content of the ETA,



Olivier Vandooren,
CEO Buildwise

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