



BRE Global Assurance (Ireland) Ltd DCU
Alpha, Old Finglas Road, Glasnevin,
Dublin, D11 KXN4, Ireland

T: +353 (0)1882 4344

E: enquiries@breglobalireland.ie

W: www.breglobalireland.ie



European Technical Assessment	ETA 23/0194 of 27/03/2023
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Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: BRE Global Ireland	
Trade name of the construction product	Lapitec sintered stone
Product family to which the construction product belongs	PAC 09 – Curtain walling/Cladding/Structural sealant glazing
Manufacturer	Breton Spa Stabilimento di Vedelago Via Bassanese, 6 Vedelago (TV) 31050 Italy
Manufacturing plant(s)	As above
This European Technical Assessment contains	10 pages including Annexes 1 and 2 which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	EAD 090142-00-0404 <i>Full-bodied sintered stone slabs for use in cladding, flooring, paving, stairs, rainscreen and curtain walling kits</i>

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1. Technical description of the product

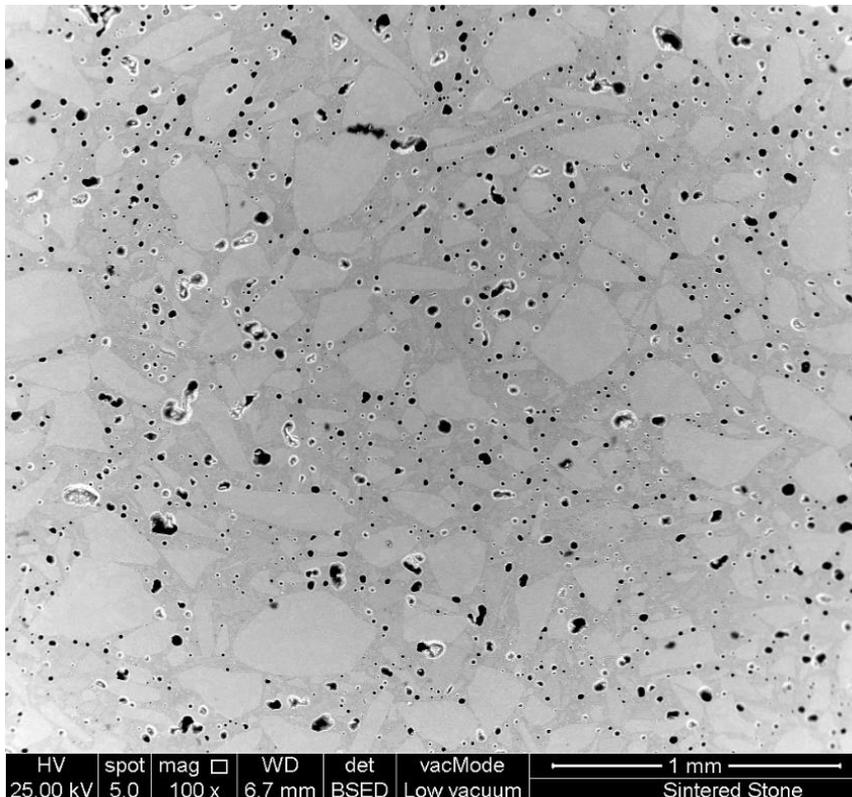
1.1 Scope

This ETA relates to Sintered Stone Slabs, as manufactured by Lapitec.

The product is a full bodied (see 1.3.1 of EAD) sintered stone (see 1.3.2 of EAD) material. It is manufactured from fine powdered natural minerals which are sintered in a high-temperature process (at between 1,100°C and 1,200°C) to produce large format (normally up to 3650mm x 2015mm, or larger if the manufacturing process allows) stone-like slabs. The slabs emerge from the manufacturing process and are then trimmed to the final size (normally up to 3500mm x 1550mm or larger if the manufacturing process allows) to release the internal tensions acquired during the sintering process. Slabs are then trimmed to the size required by the customer, generally to a tolerance of $\pm 1.5\text{mm}$ (depending on the length of the pieces).

The slabs are available in a range of thicknesses and a variety of colours and finishes. The slabs comprise entirely of the sintered material, there is no mesh bonding to the rear of the slabs.

The image below, a Scanning Electron Microscope (SEM) image produced by a Back-scattered Electron Detector (BSE) clearly indicates the structure of sintered stone.



1.2 Working Life

The assessment methods included or referred to in this EAD take into account a working life for the full-bodied sintered stone slab (for the intended uses noted in 2.1) of 25 years when installed in the works. These provisions are based upon the current state of the art and the available knowledge and experience.

1.3 Identification of the product

Full-bodied sintered stone slabs for use in cladding, flooring, paving, stairs, rainscreen and curtain walling kits.

- 3440 x 1540 mm for slabs with a thickness of 12 mm and 20 mm.
- 3400 x 1500 mm for slabs with a thickness of 30 mm.

1.4 Installation

Refer to the Technical Data Sheet (TDS) and manuals as issued by the manufacturer for further information.

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

2.1 Intended use

The slab product has a variety of non-structural uses, these include:

- internal or external finishing in walls
- internal or external floors and stairs
- infill panels in curtain walling, and
- cladding elements in external wall cladding systems

2.2 Assumptions for the manufacturer

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as is considered necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or, in the absence of such instructions, according to the usual practice of the building professionals.

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

The product was tested against the criteria as listed in Clause 2 of EAD 090142-00-0404.

Two different formulations are covered by this ETA. It is acknowledged that some tests might be influenced by different factors.

3.1 Basic Requirements for Construction Works (BRCW) and Essential characteristics

3.1.1 BRCW 1: Mechanical resistance and stability

Not applicable, according to Table 2.1 of EAD 090142-00-0404

3.1.2 BRCW 2: Safety in case of fire

3.1.2.1 Reaction to fire

Formulation 2	Standard	Classification
Reaction to Fire Classification	EN 13501-1:2018	A1

Only 1 formulation was chosen to be tested during the sample selection stage due to the similar nature of the formulations when undergoing the reaction to fire tests.

3.1.3 BRCW 3: Hygiene health and the environment

Formulation 1	Standard	Value	Unit
Water Vapour Resistance Factor (μ)	EN ISO 12572:2016	3.88 x 10 ⁴	-

Note, although the EAD states the characteristic water vapour permeability, δp , of the material is expressed in kg/(msPa), the δp value is not required in the reporting requirements of ISO 12572. It is used in determining the value for μ . As part of the data processing the δp value was generated.

3.1.4 BRCW 4: Safety and accessibility in use

Formulation 1	Standard	Value	Unit	
Flexural Strength R_{tf}	EN 14617-2:2016	45.0	MPa	
Impact Resistance (L) – 12 mm	EN 14617-9:2005	1.84	J	
Impact Resistance (L) – 20 mm		3.32		
Impact Resistance (L) – 30 mm		5.25		
Abrasion Resistance	EN 14617-4:2012	29	mm	
Slip Resistance	EN 14231:2003	Dry / Wet		-
– Finish Lux		73	17	
– Finish Satin		61	20	
– Finish Lithos		84	34	
– Finish Vesuvio		89	30	
– Finish Dune		65	28	
– Finish Arena		106	62	
– Finish Meridio		109	62	
Chemical Resistance – Finish Lux	EN 14617-10:2012	C3	-	
Dimensional Stability – 12 mm	EN 14617-12:2012	A	Class	
Dimensional Stability – 20 mm		A		
Dimensional Stability – 30 mm		A		
Change in flexural strength (as a percentage change from the original value after 25 freeze/thaw cycles). KM_{f25}	EN 14617-5:2012	96	%	
Flexural Strength R_{mf} (after 25 freeze/thaw cycles)	EN 14617-2:2016	43.2	MPa	
Linear thermal expansion coefficient	EN 14617-11:2005	5.88	10 ⁻⁶ C ⁻¹	

Formulation 2	Standard	Value	Unit
Flexural Strength R_{tf}	EN 14617-2:2016	48.5	MPa
Impact Resistance (L) – 12 mm Impact Resistance (L) – 20 mm Impact Resistance (L) – 30 mm	EN 14617-9:2005	1.58 3.00 6.99	J
Abrasion Resistance	EN 14617-4:2012	30	mm
Chemical Resistance – Finish Lux	EN 14617-10:2012	C3	-
Change in flexural strength (as a percentage of original value after 25 freeze/thaw cycles) $KM_{f,25}$	EN 14617-5:2012	95	%
Flexural Strength R_{mf} (after 25 freeze/thaw cycles)	EN 14617-2:2016	46.1	MPa
Linear thermal expansion coefficient	EN 14617-11:2005	6.06	$10^{-6} C^{-1}$

3.1.5 BRCW 5 Protection against noise

Not applicable, according to Table 2.1 of EAD 090142-00-0404

3.1.6 BRCW 6 Energy, economy and heat retention

Formulation 1	Standard	Value	Unit
Change in flexural strength (as a percentage change from the original value after 20 cycles thermal shock) $\Delta R_f, 20$	EN 14617-6:2012	-0.89	%
Flexural Strength R_{sf} (after 20 cycles thermal shock)	EN 14617-2:2016	44.6	MPa
Thermal resistance	EN 15285:2008	0.023	$Wm^{-1}K^{-1}$

Formulation 2	Standard	Value	Unit
Change in flexural strength (as a percentage change from the original value after 20 cycles thermal shock) $\Delta R_f, 20$	EN 14617-6:2012	-3.7	%
Flexural Strength R_{sf} (after 20 cycles thermal shock)	EN 14617-2:2016	46.7	MPa
Thermal resistance	EN 15285:2008	0.023	$Wm^{-1}K^{-1}$

3.1.7 BRCW 7 Sustainable use of natural resources

Not applicable, according to Table 2.1 of EAD 090142-00-0404

3.1.8. Identification

This ETA is issued for the product on the basis of agreed data/information, held on file by BRE Global Ireland which identifies the product and its constituent materials that have been assessed and judged. Identification tests according to this EAD have been carried out on components, which confirm that the system under assessment conforms to its declared characteristics.

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

According to the table below the System of assessment and verification of consistency of performance (see Annex V to Regulation (EU) No 305/2011) is:

Sintered slab usage	Decision	AVCP System
Internal or external finishing in walls		
Complete elements, used for fire protection of walls	2001/596/EC	3
Walls subject to requirements against accidental injuries from cutting objects	2001/596/EC	3
Walls subject to reaction to fire regulations (Reaction to Fire classes: A ^(**) , B ^(**) and C ^(**))	2001/596/EC	3
Walls subject to regulations on dangerous substances	2001/596/EC	3
Internal or external floors and stairs		
Internal floors and stairs including enclosed public transport premises (Reaction to Fire classes: A1 _{FL} ⁽¹⁾ - A2 _{FL} ⁽¹⁾ - B _{FL} ⁽¹⁾ - C _{FL} ⁽¹⁾)	2006/190/EC	1
Internal floors and stairs including enclosed public transport premises (Reaction to Fire classes: A1 _{FL} ⁽²⁾ - A2 _{FL} ⁽²⁾ - B _{FL} ⁽²⁾ - C _{FL} ⁽²⁾ - D _{FL} - E _{FL})	2006/190/EC	3
Internal floors and stairs including enclosed public transport premises (Reaction to Fire classes: (A1 _{FL} to E _{FL}) ⁽³⁾ , F _{FL})	2006/190/EC	4
External floors and stairs	2006/190/EC	4
Cladding in external wall cladding systems Infill panels in curtain walling.		
Walls subject to reaction to fire regulations (Reaction to Fire classes: A ^(*) , B ^(*) and C ^(*))	2001/596/EC	1
Walls subject to regulations on dangerous substances	2001/596/EC	3
Notes to Table (1) 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). (2) Products/materials not covered by (1) above. (3) Products/materials that do not require to be tested for reaction to fire (*) Materials for which the Reaction to Fire performance is susceptible to change during the production process. (**) Materials for which the Reaction to Fire performance is not susceptible to change during the production process.		

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

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan*¹ deposited with BRE Global Ireland and the factory production control shall be in accordance with it.

5.1 Tasks for the manufacturer

Factory production control

The manufacturer shall exercise permanent on-going internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use initial material stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Lapitec Factory Production Control Plan¹ relating to this European Technical Assessment which is part of the technical documentation of this European Technical Assessment. The Lapitec Factory Production Control Plan is laid down in the context of the factory production control system operated by the manufacturer (Breton) and deposited at BRE Global Ireland.

The prescribed test plan defined in Annex 2 gives the type and frequency of checks and tests conducted during production and on the final product as part of the continuous internal production control.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Lapitec Factory Production Control Plan.

The records contain at least the following information:

- designation of the product or basic materials and the components.
- type of control or testing.
- date of manufacture and of testing of product or components and of basic materials or components.
- results of controls and tests and, where relevant, comparison with the requirements.
- signature of person responsible for the factory production control.

If the test results are unsatisfactory, the manufacturer shall immediately implement measures to eliminate defects. Construction products or components which are not in compliance with the requirements shall be handled such that they cannot be mistaken for products complying with the requirements. After elimination of the defects the relevant tests shall be immediately repeated as far as is technically possible and necessary for verifying the deficiency elimination.

^{#1} The "control plan" is a confidential part of the European Technical Assessment and only handed over to the notified body or bodies involved in the process of assessment and verification of constancy of performance.

5.2 Tasks for the notified body

The notified body (bodies) shall perform the

- Determination of the product-type on the basis of type testing (including sampling), type calculation, tabulated values, or descriptive documentation of the product,
- initial inspection of factory and of factory production control,
- continuous surveillance, assessment, and approval of factory production control,

in accordance with the provisions laid down in the "Control Plan" relating to this European Technical Assessment.

The notified body (bodies) shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

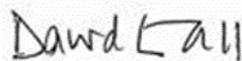
The main production centre is checked at least once a year by the notified body. Each component manufacturer is checked at least once every five years by the notified body.

The notified body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European Technical Assessment.

In cases where the provisions of the European Technical Assessment and the Lapitec Factory Production Control Plan are no longer fulfilled the notified body shall withdraw the certificate of conformity and inform BRE Global Ireland without delay.

Issued in Dublin, Ireland on 27.03.2023

By



David Gall
Certification Engineer
BRE Global Assurance (Ireland) Ltd

Annex 1 – Handling and Storage

The manufacturer has provided extensive information on the methods for mechanical loading and unloading Lapitec slabs, even stipulating the use of air bags.

For handling of individual slabs, the following list of precautions is offered.

- The slabs should always be handled from the side to prevent bending.
- Operators should avoid any type of impact on the slabs. In the event of accidental impact, it is necessary to check that there is no breakage or cracks. This check is important because any cracks may cause breakage even after laying.
- Any format exceeding 25 kg and in general any long-sized format must be handled by two operators.
- Slabs can be moved individually using rubber-coated canvas straps, rubber grippers or suction cups. Under no circumstances should steel chains or ropes be used as these may ruin the material.
- To grip the individual slab, it is recommended to position the gripper at the load centre to balance the weight and minimize oscillations. When putting down a slab with the gripper, make sure that between what is being positioned and the support (other slab or floor) there are no empty spaces.
- To grip multiple slabs, it is recommended to use a balancing frame connected to canvas straps spaced on the bottom and on top of the slabs by a wooden shim slightly longer than the slab pack. In this way, the stress exerted during handling does not weigh on the slabs, preventing material breakage.
- Handling using suction cups is permitted, subject to verification of compatibility with the roughness of the surface.

Refer to the Technical Data Sheet (TDS) and manuals as issued by the manufacturer for further information.

Annex 2 – Test/Control plan

No	Subject/type of control (product, raw/constituent material, component - indicating characteristic concerned)	Test or control method (refer to 2.2)	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed Test Plan] (for AVCP System 4 only)					
1	Reaction to fire	2.2.1	Control plan	See test method	Initial testing ¹
2	Water vapour permeability	2.2.2	Control plan	See test method	Initial testing ¹
3	Flexural strength	2.2.3	Control plan	See test method	Every 6,000 slabs produced
4	Impact resistance	2.2.4	Control plan	See test method	Every 6,000 slabs produced
5	Abrasion resistance	2.2.5	Control plan	See test method	Every 6,000 slabs produced
6	Slip resistance	2.2.6	Control plan	See test method	Every 40,000 slabs produced
7	Chemical resistance	2.2.7	Control plan	See test method	Initial testing ¹
8	Dimensional stability	2.2.8	Control plan	See test method	Initial testing ¹
9	Resistance to freeze-thaw	2.2.9	Control plan	See test method	Every 36,000 slabs produced
10	Linear thermal expansion	2.2.10	Control plan	See test method	Initial testing ¹
11	Thermal shock	2.2.11	Control plan	See test method	Every 36,000 slabs produced
12	Thermal conductivity	2.2.12	Control plan	See test method	Initial testing ¹
Notes to Table.					
¹ Performance will be assessed when the ETA is first developed. Subsequent periodic testing will not be required as product performance will not change unless the input materials or the production process itself changes. This eventuality will be covered by the Factory Production Control system for the product.					
The clauses stated in this table refer to the clause numbers within EAD 090142-00-0404.					