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European Assessment Document for

Full-bodied sintered stone slabs for use in claddings, floorings, paving, stairs, rainscreens and curtain walling kits

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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

Contents

1 SCOPE OF THE EAD

1.1 Description of the construction products

The construction products are full-bodied sintered stone slabs for use in claddings, floorings, paving, stairs, rainscreens and curtain walling kits (in the following referred to as “sintered stone slabs”). It is manufactured from fine powdered natural minerals which are sintered in a high-temperature process (at between 1100 °C and 1200 °C) to produce large format (up to 3650 mm x 2015 mm or larger if the manufacturing process allows) sintered stone slabs. The sintered stone slabs emerge from the manufacturing process and are then trimmed to the final size (up to 3365 mm x 1500 mm or larger if the manufacturing process allows) to release the internal tensions acquired during the sintering process. Sintered stone slabs are then trimmed to the size required by the customer, to a tolerance of ± 0,5 mm.

The sintered stone slabs are available in a range of thicknesses and a variety of colours and surface finishes, which shall be provided by the manufacturer’s product information. Sintered stone slabs comprise entirely of the sintered material, there is no mesh bonding to the rear of the sintered stone slabs.

The image below (Figure 1.1.1), a Scanning Electron Microscope (SEM) image produced by a Back-scattered Electron Detector (BSED) clearly indicates the structure of sintered stone.

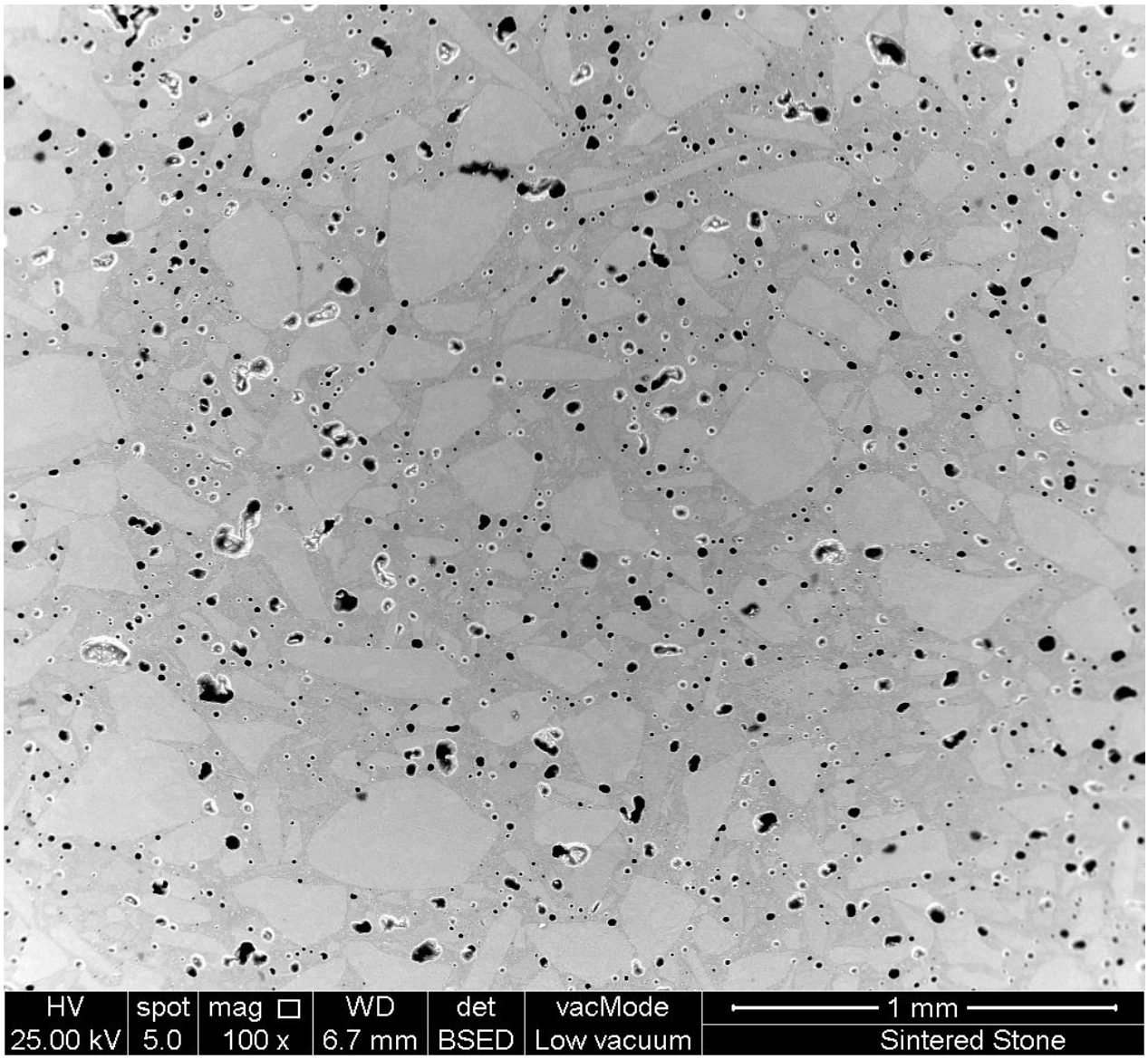

Figure 1.1.1: SEM image of sintered stone

Sintered stone consists of an 'aggregate' nominally less than 1 mm, held within a matrix/binder of sintered powders. Sintered stone makes use of a matrix/binder of inorganic sintered powders. Sintered stone has a structure that contains 'aggregate' grains of range is 0-300 µm and a matrix/binder.

Ancillary products, which can be a part of installation provisions, are not covered by this EAD.

The product is not fully covered by a harmonised European Standard. Similar standards as listed below exist for agglomerated stone, natural stone, and ceramic tiles, but the manufacturing process of sintered stone makes it different to those listed, as described below.

- EN 15285[1] and EN 15286 for agglomerated stone: agglomerated stone is defined as a material which is bonded together using a resin or similar substance. As such it is not recyclable (due to the presence of the resin). Sintered stone does not include any other material beyond the fine powdered natural minerals and at end of use can be recycled to possibly create a new sintered product. Specifically, EN 14618 (at Clause 3.1) clearly defines 'agglomerated stone' as a material where 'the manufacturing process is irreversible'. Tactility/visibility characteristics are not relevant for the sintered stone slabs.
- EN 12058 for natural stone: natural stone cannot be treated and assessed as a manufactured stone.
- EN 14411 for ceramic tiles: it can be seen from the SEM image in Figure 1.1.1 above and accompanying materials description and comparison that there is a clear technical difference between the compositions of ceramics, agglomerated stone and sintered stone.

Hence, existing standards for ceramics and agglomerated stone are not applicable to sintered stone.

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 absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations, e.g., with regard to the intended end use conditions, having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA as long as the details of the assessment methods as laid down in this EAD are respected.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

The sintered stone slabs are intended to be used for non-structural uses, these include:

- cladding elements in external wall cladding systems
- internal or external floorings and stairs
- internal or external paving
- rainscreen elements in external rainscreens systems
- infill panels in curtain walling kits

The sintered stone slabs can be used in architecture and design for various internal and/or external applications and can be installed using adhesives, structural bonding or mechanical fixings.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the sintered stone slabs for the intended use of 25 years when installed in the works (provided that the sintered stone slabs are subject to appropriate installation (see

1 All undated references to standards in this EAD are to be understood as references to the dated versions listed in chapter 4.

1.1)). These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product, the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works[2].

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

1.3 Specific terms used in this EAD

1.3.1 Full-bodied

The sintered stone slab is homogenous in appearance and performance throughout its thickness. Any marbling effect is retained throughout the depth of the material as in a natural marbled product (i.e., it is not a surface effect). The product is workable as natural stone would be throughout its entire thickness enabling the finish of the sintered stone slab to be retained even if the material is cut or shaped.

1.3.2 Sintered stone

An industrial product made from a wet mixture of powdered minerals, including Wollastonite, Mullite, Zircon, Albite, Corundum, Anorthite, and Hematite (sintered powders), without the use of resin or cement. The material is cold-formed through vibro-compression (under vacuum) and, after drying, is consolidated by sintering at temperatures between 1100°C and 1200°C. The manufacturing process is reversible.

2 The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of the sintered stone slabs is assessed in relation to the essential characteristics.

Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

No.	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	2.2.1	Class
Basic Works Requirement 3: Hygiene, health and the environment			
2	Apparent density and water absorption	2.2.2	Level [M_v in kg/m^3] [C in %]
3	Water vapour permeability	2.2.3	Level [δ_p, in kg/(m·s·Pa)]
4	Content, emission and/or release of dangerous substances	2.2.4	Description, level [µg/m^3 or mg/m^3]
Basic Works Requirement 4: Safety and accessibility in use			
5	Flexural strength	2.2.5	Level [$\bar{R}_{tf}$ in MPa]
6	Compressive strength*	2.2.6	Level [$\bar{R}$ in MPa, s in MPa]
7	Impact resistance	2.2.7	Level [L in Joules]
8	Abrasion resistance*	2.2.8	Level [mm]
9	Slip resistance*	2.2.9	Level [Slip Resistance Value (SRV) in wet and dry conditions]
10	Chemical resistance	2.2.10	Class

11	Bond strength / adhesion**	2.2.11	Level [in N/mm^2]
11	Mechanical resistance[1] of the connection between the sintered stone slabs and fixings – Pull through resistance	EAD 090062-01-0404, Clause 2.2.12.5	Level [$F_{u,m}$ in N] [$F_{u,c}$ in N]
12	Mechanical resistance[1] of the connection between the sintered stone slabs and fixings – Pull through resistance under shear loads	EAD 090062-01-0404, Clause 2.2.12.6	Level [$F_{u,m}$ in N] [$F_{u,c}$ in N]
13	Mechanical resistance[1] of the connection between the sintered stone slabs and fixings – Axial tension resistance	EAD 090062-01-0404, Clause 2.2.12.7	Level [$F_{u,m}$ in N] [$F_{u,c}$ in N]
14	Mechanical resistance[1] of the connection between the sintered stone slabs and fixings – Shear load resistance	EAD 090062-01-0404, Clause 2.2.12.8	Level [$F_{u,m}$ in N] [$F_{u,c}$ in N]
15	Mechanical resistance[1] of the connection between the sintered stone slabs and fixings – Combined tension and shear load resistance	EAD 090062-01-0404, Clause 2.2.12.9	Level [$F_{u,m}$ in N] [$F_{u,c}$ in N]
Basic Works Requirement 6: Energy economy and heat retention			
16	Thermal conductivity	2.2.12	Level [λ in W/(m·K)]
Aspects of Durability			
17	Dimensional stability	2.2.13	Class
18	Resistance to freeze-thaw***	2.2.14	Level [$KM_{f\,25}$ in %]
19	Linear thermal expansion	2.2.15	Level [α_l in 10^{-6} °C^{-1}]
20	Thermal shock***	2.2.16	Level [$\Delta R_{f,20}$ in %]

[1] Mechanical resistance is assessed by means of the mechanical characteristics between the sintered stone slabs and their fixings (connection between the cladding elements and the cladding fixings). See the relevant subclauses of Clause 2.2.12 in EAD 090062-01-0404.

* Only relevant for sintered stone slabs for use on flooring applications.

** Only relevant for sintered stone slabs glued by adhesive or mortar.

*** Only relevant for sintered stone slabs for use on external walls.

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

Some tests will not be appropriate for particular uses or location of the sintered stone product (e.g., slip tests for the product when used as a walling material, freeze/thaw testing for internal use). Final test selection shall be determined by product use and location.

2.2.1 Reaction to fire

The sintered stone slabs shall be tested, using the method(s) relevant for the corresponding reaction to fire class in accordance with EN 13501-1. The sintered stone slabs shall be classified in accordance with the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

The reaction to fire classification shall be stated in the ETA.

2.2.2 Apparent density and water absorption

The apparent density and water absorption shall be determined in accordance with EN 14617-1, Clause 5, using at least six specimens of size which suits to test equipment but measuring at least 100mm x 100mm with a thickness of 10±2 mm.

The mean apparent density, M_v, expressed in kg/m^3 and mean water absorption, C, expressed as a % shall be stated in the ETA.

2.2.3 Water vapour permeability

The water vapour permeability shall be determined by test in accordance with EN ISO 12572, Annex A, using the minimum thickness of material to be covered in the ETA. At least five specimens shall be tested using test condition A (dry cup), with the specimen size being dependent on the test assembly type used (see EN ISO 12572, Clause 6.2.1).

The mean water vapour permeability, δ_p, expressed in kg/(m·s·Pa) shall be stated in the ETA.

2.2.4 Content, emission and/or release of dangerous substances

The performance of the product regarding the emissions and/or release and, where appropriate, the content of dangerous substances shall be assessed on the basis of the information provided by the manufacturer[3] after identifying the release scenarios taking into account the intended uses of the product and the Member States where the manufacturer intends his product to be made available on the market.

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3 The manufacturer may be asked to provide to the TAB the REACH related information which shall accompany the DoP (cf. Article 6(5) of Regulation (EU) No 305/2011).

The manufacturer is **not** obliged to:
- provide the chemical constitution and composition of the product (or of constituents of the product) to the TAB, or
- provide a written declaration to the TAB stating whether the product (or constituents of the product) contain(s) substances which are classified as dangerous in accordance with Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the SGDS, taking into account the installation conditions of the construction product and the release scenarios resulting from there.

Any information provided by the manufacturer regarding the chemical composition of the products is not to be distributed to EOTA, to other TABs or beyond.

The identified intended release scenarios for this product and the different intended uses with respect to dangerous substances are:

IA1: Product with direct contact to indoor air (for the intended uses according to the 2nd and 3rd bullet point in Clause 1.2.1

S/W2: Product with indirect contact to soil, ground- and surface water (for the intended uses according to the 1st, 4th and 5th bullet point in Clause 1.2.1

2.2.4.1 SVOC and VOC

For the intended use covered by the release scenario IA1 semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) shall be determined in accordance with EN 16516. The loading factor used for emission testing shall be 1,0 m^2/m^3.

The preparation of the test specimen shall be performed by using a representative sample of the product.

Once the test specimen has been produced, as described above, it shall immediately be placed in the emission test chamber. This time is considered the starting time of the emission test.

The test results shall be reported for the relevant parameters (e.g., chamber size, temperature and relative humidity, air exchange rate, loading factor, size of test specimen, conditioning, production date, arrival date, test period, test result) after 3 and/or 28 days testing.

The product performance shall be expressed in [$\mu g/m^3$ or mg/m^3] and stated in the ETA.

2.2.4.2 Leachable substances

For the intended use covered by the release scenario S/W2 the performance of the sintered stone concerning leachable substances shall be assessed.

A leaching test with subsequent eluate analysis shall take place, each in duplicate. Leaching tests of the test specimens shall be conducted in accordance with EN 16637-2. The leachant shall be pH-neutral demineralised water and the ratio of liquid volume to surface area shall be (80 ± 10) l/m^2.

Specimens shall be prepared in accordance with Clause 8.2 of EN 16637-2.

In eluates of "6 hours" and "64 days", the following biological tests shall be conducted:

- Acute toxicity test with Daphnia magna Straus in accordance with EN ISO 6341,
- Toxicity test with algae in accordance with EN ISO 15799,
- Luminescent bacteria test in accordance with EN ISO 11348-1.

For each biological test, EC20-values shall be determined for dilution ratios 1:2, 1:4, 1:6, 1:8 and 1:16.

If the parameter TOC is higher than 10 mg/l, the following biological test shall be conducted with the eluates of "6 hours" and "64 days":

Biological degradation in accordance with OECD Test Guideline 301, parts A, B or E.

Determined toxicity in biological tests shall be expressed as EC20-values for each dilution ratio and given in the ETA. Maximum determined biological degradability shall be expressed as "... % within ... hours/days". The respective test methods for analysis shall be specified.

2.2.5 Flexural strength

The flexural strength shall be determined in accordance with EN 14617-2. Test specimens shall have a thickness corresponding to that of the final product. The total length of the specimen shall be 200 ± 0,3mm. The width shall be 50 ± 0,3 mm, and in no case shall it be less than the thickness of the specimen.

Due to the homogeneous nature of this material type this test can be undertaken at any thickness with the result being applicable to all available thicknesses. At least Ten specimens shall be tested. In all cases the kind of surface finish and its orientation shall be stated in the ETA.

The mean value of flexural strength, $\bar{R}_{tf}$, and standard deviation, expressed in MPa, shall be stated in the ETA.

2.2.6 Compressive strength

Compressive strength shall be determined in accordance with EN 1926 using cubes of 50 ± 5 mm. The height of the specimens can be achieved by gluing together pieces of lesser thickness.

The mean compressive strength, $\bar{R}$, and standard deviation, s, both expressed in MPa, shall be stated in the ETA.

2.2.7 Impact resistance

The impact resistance shall be determined in accordance with EN 14617-9 using at least four specimens of size which suits to test equipment but measuring at least 200 mm x 200 mm.

This test shall be performed on the worst case thickness (i.e., the thinnest product) being tested. The impact resistance value, being expressed as the mean fracture work value (*L*) in Joules, shall be stated in the ETA.

2.2.8 Abrasion resistance

Abrasion resistance shall be determined in accordance with EN 14617-4.

At least six specimens shall be tested. They shall be taken from manufactured sintered stone slabs incorporating the upper face of the specimen and cut to the proper size for the measuring apparatus. They shall be of a minimum size of 100 mm × 70 mm. In some cases, the finished face of the sintered stone slab may have a rough texture and could overcome the allowed tolerance within the test specification. If this is the case then the face shall be lightly ground to provide a smooth, flat surface that will fulfil the allowed tolerance. The ETA shall state whether the face was ground.

Abrasion resistance expressed in mm shall be stated in the ETA.

2.2.9 Slip resistance

Slip resistance shall be determined in accordance with EN 14231 using the wide slider.

At least six specimens shall be tested for each sintered stone surface finish. They shall be taken from manufactured sintered stone slabs and will incorporate the upper, finished face of each sintered stone slab. Each specimen shall permit a minimum test area of 136 mm × 86 mm. The Slip Resistance Value (SRV) for both wet and dry conditions shall be determined.

The SRV for wet and dry conditions shall be stated in the ETA.

2.2.10 Chemical resistance

Chemical resistance shall be determined in accordance with EN 14617-10.

At least four specimens shall be tested for each sintered stone surface finish. The specimens shall be of size which suits to test equipment but measuring at least 300 mm × 300 mm. A containing ring (100 ± 5mm diameter) shall be fixed to each specimen. Two reagents shall be used:

- A water solution containing hydrochloric acid 50 % (±1%) (V/V) solution prepared from normal hydrochloric acid solution.
- A water solution containing sodium hydroxide 50 % (±1%) (V/V) solution prepared from a normal water sodium hydroxide non-carbonated solution.

Results shall be expressed as one of the four possible Classes in accordance with EN 15285, Clause 4.2.2, Table 2.

Chemical resistance Class shall be stated in the ETA.

2.2.11 Bond strength / adhesion

The bond strength / adhesion shall be determined in accordance with EN 15286, Clause 4.2.10, while most of the test standards referred to in this clause have been replaced by other standards. Thus, the bond strength / adhesion shall be evaluated following the test method outlined in the following standards, as relevant:

- For cementitious adhesives: in accordance with EN 12004-2, Clause 8.3, including the test in accordance with Clause 8.3.3.2 as well as the tests after conditioning in accordance with Clauses 8.3.3.3, 8.3.3.4 and 8.3.3.5;
- For dispersion adhesives: in accordance with EN 12004-2, Clause 8.4, including the test in accordance with Clause 8.4.3.2 as well as the tests after conditioning in accordance with Clauses 8.4.3.3, 8.4.3.4 and 8.4.3.5;
- For reaction resin adhesives: in accordance with EN 12004-2, Clause 8.5, including the test in accordance with Clause 8.5.3.2 as well as the tests after conditioning in accordance with Clauses 8.5.3.3 and 8.5.3.4;
- For mortar: in accordance with EN 1015-12.

Please note EN 12004-2 supersedes EN 1324 :2007, EN 1348 :2007 and EN 12003 :2008.

2.2.12 Thermal conductivity

Thermal conductivity shall be determined from tabulated values or by measurement. When derived from tabulated values, thermal conductivity shall be determined in accordance with EN 15286, Clause 4.2.6, using mean apparent density of the product as determined in accordance with 2.2.2 and with reference to Table 3 of ENISO 10456 and the stone with the closest apparent density.

Thermal conductivity may also be obtained by testing in accordance with EN ISO 13787, Clause 5.1, using the method described in EN 12667. Determination of thermal conductivity by testing shall be considered the reference method.

Mean thermal conductivity λ expressed in W/(m·K) shall be stated in the ETA together with the method used.

2.2.13 Dimensional stability

Dimensional stability shall be determined in accordance with EN 14617-12.

A single specimen, with dimensions of 300±5 mm x 300±5 mm and representing the worst case (i.e., the thinnest product), shall be tested.

Results shall be expressed as one of the three possible Classes in accordance with EN 14617-12, Clause 8, Table 1, depending on the vertical displacement, D.

Dimensional stability Class shall be stated in the ETA.

2.2.14 Resistance to freeze-thaw

Resistance to freeze-thaw shall be determined in accordance with EN 14617-5. The thickness of the specimens shall be the product thickness, with the length and width being of size which suits to test equipment but measuring at least 200 mm x 50 mm. Due to the homogeneous nature of this material type this test can be undertaken at any thickness with the result being applicable to all thicknesses to be covered by the ETA.

One set of five specimens shall be tested after being subjected to freeze-thaw cycling. The flexural strength after cycling shall be compared with the unaged flexural strength (R_{tf}) as determined in Clause 2.2.5.

After the 25th cycle the average flexural strength values (RM_f) for each specimen shall be determined in accordance with EN 14617-5.

The mean coefficient of freeze-thaw resistance as a change in flexural strength (after 25 freeze/thaw cycles) $KM_{f\,25}$ expressed in % shall be stated in the ETA as per the formula in Clause 8 of EN 14617-5.

2.2.15 Linear thermal expansion

Linear thermal expansion shall be determined in accordance with EN 10545-8 on two specimens. Due to the homogeneous nature of this material type this test can be undertaken at any thickness with the result being applicable to available thicknesses to be covered by the ETA.

The size of the specimens shall be dependent on the measurement technique used.

The mean linear thermal expansion coefficient α_l expressed in 10^{-6} °C^{-1}, for both test specimens, shall be stated in the ETA.

2.2.16 Thermal shock

Resistance to thermal shock shall be determined in accordance with EN 14617-6. The thickness of the specimens shall be the product thickness, with the length and width being of size which suits to test equipment but measuring at least 200 mm x 50 mm. Due to the homogeneous nature of this material type this test can be undertaken at any thickness with the result being applicable to all available thicknesses.

One set of seven specimens shall be tested after being subjected to thermal shock cycling. The flexural strength after cycling shall be compared with the unaged flexural strength (R_f) as determined in Clause 2.2.5.

After the 20th cycle the mean flexural strength (R_{sf}) shall be determined in accordance with EN 14617-6.

The mean coefficient of thermal shock resistance as a change in flexural strength (after 20 cycles) $\Delta R_{f,20}$ expressed in % shall be stated in the ETA.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal acts are:

- Commission Decision 98/437/EC, as amended by Commission Decision 2001/596/EC,
- Commission Decision 97/808/EC, as amended by Commission Decisions 1999/453/EC, 2001/596/EC and 2006/190/EC,
- Commission Decision 96/580/EC, as amended by Commission Decision 2001/596/EC.

The systems are specified in Table 3.1.1.

Table 3.1.1 Systems of assessment and verification of constancy of performance (AVCP) to be applied

	Sintered stone slab usage	**Decision**	**AVCP System**
	Internal or external finishing in walls		
1	Complete elements, used for fire protection of walls	98/437/EC	3
2	Walls subject to requirements against accidental injuries from cutting objects	98/437/EC	3
3	Walls subject to reaction to fire regulations (Reaction to fire classes: A1(1), A2(1), B(1), C(1))	98/437/EC	1
4	Walls subject to reaction to fire regulations (Reaction to fire classes: A1(2), A2(2), B(2), C(2), D, E)	98/437/EC	3
5	Walls subject to reaction to fire regulations (Reaction to fire classes: A1(3), A2(3), B(3), C(3), D(3), E(3), F)	98/437/EC	4
6	Walls subject to regulations on dangerous substances	98/437/EC	3
7	Walls not covered by rows 1 to 6 of this table	98/437/EC	4
	Internal or external floors and stairs		
8	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))	97/808/EC	1
9	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})	97/808/EC	3
10	Internal floors and stairs including enclosed public transport premises (Reaction to fire classes: ($A1_{FL}$ to E_{FL})(3), F_{FL})	97/808/EC	4
11	External floors and stairs	97/808/EC	4
	Notes to Table 3.1.1 (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 (e.g., Products/materials of Classes A1 in accordance with Commission Decision 96/603/EC, as amended by Commission Decisions 2000/605/EC and 2003/424/EC).		

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the full-bodied sintered stone slab in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

Table 3.2.1 Control plan for the manufacturer: Cornerstones

No	Subject/type of control	Test or control method	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]					
1	Reaction to fire	2.2.1	According to control plan	According to test method	Initial testing[1]
2	Water vapour permeability	2.2.2	According to control plan	According to test method	Initial testing[1]
3	Flexural strength	2.2.3	According to control plan	According to test method	Every 6000 slabs produced
4	Impact resistance	2.2.4	According to control plan	According to test method	Every 6000 slabs produced
5	Abrasion resistance	2.2.5	According to control plan	According to test method	Every 6000 slabs produced
6	Slip resistance	2.2.6	According to control plan	According to test method	Every 40000 slabs produced
7	Chemical resistance	2.2.7	According to control plan	According to test method	Initial testing[1]
8	Dimensional stability	2.2.8	According to control plan	According to test method	Initial testing[1]
9	Resistance to freeze-thaw	2.2.9	According to control plan	According to test method	Every 36000 slabs produced
10	Linear thermal expansion	2.2.10	According to control plan	According to test method	Initial testing[1]
11	Thermal shock	2.2.11	According to control plan	According to test method	Every 36000 slabs produced
12	Thermal conductivity	2.2.12	According to control plan	According to test method	Initial testing[1]

Note to Table 3.2.1

[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.

3.3 Tasks of the notified body

The intervention of the notified body under AVCP system 1 is only necessary for reaction to fire for 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).

In this case the cornerstones of the actions to be undertaken by the notified body under AVCP system 1 are laid down in Table 3.3.1.

Table 3.3.1 Control plan for the notified body: Cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control					
1	The notified body will consider especially the clearly identifiable stage in the production process which results in an improvement of the reaction to fire classification (e.g., an addition of fire retardants or a limiting of organic material).	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	As defined in the control plan agreed between the TAB and the manufacturer	As defined in the control plan agreed between the TAB and the manufacturer	When starting the production or a new line
Continuous surveillance, assessment and evaluation of factory production control					
2	The notified body will consider especially the clearly identifiable stage in the production process which results in an improvement of the reaction to fire classification (e.g., an addition of fire retardants or a limiting of organic material)	Verification of the controls carried out by the manufacturer as described in the control plan agreed between the TAB and the manufacturer with reference to the raw materials, to the process and to the product as indicated in Table 3.2.1	As defined in the control plan agreed between the TAB and the manufacturer	As defined in the control plan agreed between the TAB and the manufacturer	1/year

4 REFERENCE DOCUMENTS

EN 1015-12:2016	Methods of test for mortar for masonry - Part 12: Determination of adhesive strength of hardened rendering and plastering mortars on substrates
EN 1926:2006	Natural stone test methods - Determination of uniaxial compressive strength
EN 12004-2:2017	Adhesives for ceramic tiles - Part 2: Test methods
EN 12058:2004	Natural stone products - Slabs for floors and stairs - Requirements
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 13501-1:2018	Fire classification of construction products and building elements - Classification using data from reaction to fire tests
EN 14231:2003	Natural stone test methods - Determination of the slip resistance by means of the pendulum tester
EN 14411:2012	Ceramic tiles - Definitions, classification, characteristics, evaluation of conformity and marking
EN 14617-1:2013	Agglomerated stone - Test methods - Part 1: Determination of apparent density and water absorption
EN 14617-2:2016	Agglomerated stone - Test methods - Part 2: Determination of flexural strength (bending)
EN 14617-4:2012	Agglomerated stone - Test methods - Part 4: Determination of the abrasion resistance
EN 14617-5:2012	Agglomerated stone - Test methods - Part 5: Determination of freeze and thaw resistance
EN 14617-6:2012	Agglomerated stone - Test methods Part 6: Determination of thermal shock resistance
EN 14617-9:2005	Agglomerated stone - Test methods - Part 9: Determination of impact resistance
EN 14617-10:2012	Agglomerated stone - Test methods Part 10: Determination of chemical resistance
EN 14617-11:2005	Agglomerated stone - Test methods - Part 11: Determination of linear thermal expansion coefficient
EN 14617-12:2012	Agglomerated stone - Test methods - Part 12: Determination of dimensional stability
EN 14618:2009	Agglomerated stone - Terminology and classification
EN 15285:2008 +AC:2008	Agglomerated stone - Modular tiles for flooring and stairs (internal and external)
EN 15286:2013	Agglomerated stone - Slabs and tiles for wall finishes (internal and external)
EN 16516:2017 + A1:2020	Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air
EN 16637-2:2023	Construction products: Assessment of release of dangerous substances. Horizontal dynamic surface leaching test

EN ISO 6341:2012	Water quality - Determination of the inhibition of the mobility of Daphnia magna Straus (Cladocera, Crustacea) Acute toxicity test (ISO 6341:2012)
EN ISO 10456:2007+AC:2009	Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007+Cor1:2009)
EN ISO 10545-8:2014	Ceramic tiles - Part 8: Determination of linear thermal expansion (ISO 10545-8:2014)
EN ISO 11348-1:2008 + A1:2018	Water quality -. Determination of the inhibitory effect of water samples on the light emission of Vibrio fischeri (Luminescent bacteria test) - Part 1: Method using freshly prepared bacteria (ISO 11348-1:2007+Amd1:2018)
EN ISO 12572:2016+A1:2024	Hygrothermal performance of building materials and products - Determination of water vapour transmission properties - Cup method (ISO 12572:2016+Amd1:2024)
EN ISO 13787:2003	Thermal insulation products for building equipment and industrial installations - Determination of declared thermal conductivity (ISO 13787:2003)
EN ISO 15799:2022	Soil quality - Guidance on the ecotoxicological characterization of soils and soil materials (ISO 15799:2019)
OECD (1992), Test No. 301	Ready Biodegradability, OECD Guidelines for the Testing of Chemicals, Section 3, OECD Publishing, Paris, https://doi.org/10.1787/9789264070349-en
EAD 090062-01-0404	Kits for external wall claddings mechanically fixed