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European Assessment Document for

Composite floor coverings for use in external and in internal areas



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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).

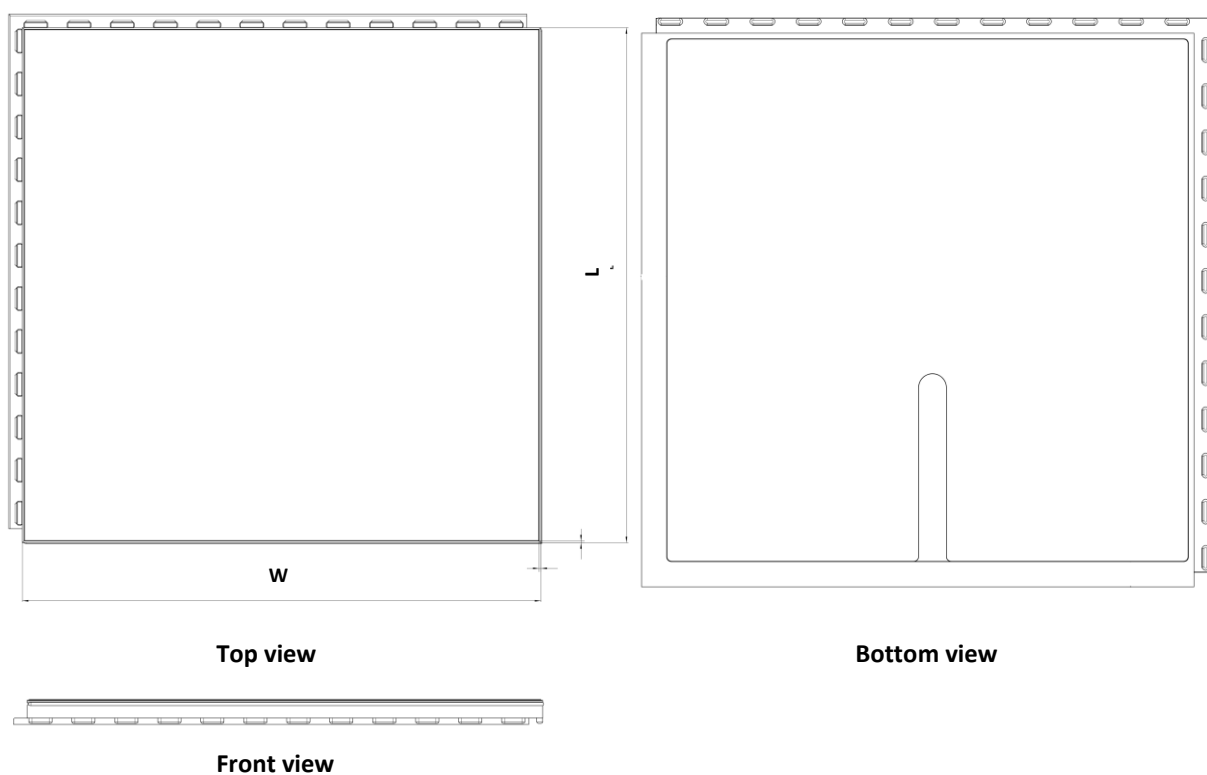
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1 SCOPE OF THE EAD

1.1 Description of the construction product

The construction product “Composite floor coverings for use in external and in internal areas”, named “composite tiles” hereinafter, is a loose laid composite, multi-material floor covering which consists of a dry-pressed porcelain ceramic tile made from a mixture of clay minerals and non-clayish minerals pre-assembled to and embedded in a moulded polyurethane frame, which provides for the junction between the composite tiles; thus the product is made of two parts as described above, bonded together by physical adhesion (see Figure 1.1.1). For a proper functioning as floor covering, a low water absorption level of the porcelain ceramic tile part of the product is required, that is $\leq 0,5\%$ as percentage by mass, determined in accordance with EN ISO 10545-3¹. For the terms “dry-pressed” and “porcelain ceramic tile”, the references are the definitions given in EN 14411. The dimensions of the construction product can vary as for thickness, width and length.



Legend:

W: width of the porcelain ceramic tile comprising the polyurethane thin edge (excluding the joint)

L: length of the porcelain ceramic tile comprising the polyurethane thin edge (excluding the joint)

Figure 1.1.1: An example of composite tile: porcelain ceramic tile with polyurethane frame

The composite tiles are to be installed in external areas subject to pedestrian traffic and in internal areas as well. In case of outdoor installation on ground substrates, these shall be previously prepared (as an example, levelled at a depth of 15-20 cm, with a maximum incline of 3%, and subsequently covered with a fine grade (3-5 mm) gravel drainable layer). The area to be paved can be enclosed by edging profiles. In case the composite tiles are installed on pre-existing floors inclined for drainage, a drainable mat can be laid as substrate on the pre-existing floor. Gravel, enclosing profiles and mats for drainage are not covered by this EAD.

The product is not fully covered by the following harmonised technical specification: EN 14411, due to the presence of organic material (the moulded polyurethane frame) which implies that the envisaged assessment methods need amendments in order to be applicable to the composite tiles. In particular, the composite tiles need to be tested in order to be classified for reaction to fire, as they cannot be classified without testing (as it is envisaged in EN 14411) due to the contained organic material. Furthermore, because of the presence of the moulded polyurethane frame the temperature operated by the oven for the tests of resistance to thermal shock, frost resistance and chemical resistance has to be lowered.

In addition, in deviation from Annex ZA, Table ZA.1.1 of EN 14411, the characteristics “Release of dangerous substances: Cadmium” and “Release of dangerous substances: Lead” have not been considered because the composite tiles are not intended to be used where there are requirements on these substances (i.e., for surfaces in contact with food, see clause 1.2.1). Finally, with respect to Annex ZA of EN 14411 other characteristics have been included in the EAD for their relevance on the composite tile, characteristics which are, however, listed in Table 2 of clause 5.2 of EN 14411 and reported in the following: water absorption of the ceramic tile, thickness, impact resistance, resistance to thermal shock and chemical resistance (to high concentration of acids and alkalis).

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 he considers 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 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.

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

1.2.1 Intended use(s)

The composite tiles are intended to be used as floor covering for external areas subject to pedestrian traffic (Use 1) and for internal areas (Use 2), with manual installation. The product is dry installed without the need for glue and the installation can be on a ground substrate or on pre-existing floors. The composite tiles are not intended for the use on surfaces possibly in contact with food.

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 composite tiles for the intended use of 25 years when installed in the works (provided that the product is subject to appropriate installation (see 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 works².

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

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.

1.3 Specific terms used in this EAD

1.3.1 Specific terms

Water absorption level of the ceramic tile: percentage by mass of water absorbed by the ceramic body.

Product loading factor: ratio of exposed dimension of the test specimen to the empty test chamber volume.

Specific emission rate: mass of a vapour phase organic compound emitted (VOC or SVOC) per unit of product per unit of time at a given time from the start of the test.

Profile feature: single component of a tactile paving surface indicator.

Layout: layout of the profile features on the surface of the composite tile when used for tactile paving surfaces.

1.3.2 Symbols

E_v	[%]	Water absorption of the ceramic tile
α_{shod}	[°]	Critical angle of inclination in the Shod ramp test
S	[N]	Breaking strength
R	[N/mm ²]	Modulus of rupture
e	[-]	Coefficient of restitution (COR)
n	[-]	Number of specimens with visible defects after the thermal shock test
n_F	[-]	Number of the damaged tiles after the number of cycles in the freeze test
t	[mm]	Thickness (edges of the composite tile)

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Tables 2.1.1 and 2.1.2 show how the performance of the composite tiles 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 (Use 1)

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	Water absorption of the ceramic tile	2.2.2	Level E_v [%]
3	Content, emission and/or release of dangerous substances: - Leachable substances	2.2.3.1	Description and level - EC20-values for each dilution ratio - [% within ... hours/days]
Basic Works Requirement 4: Safety and accessibility in use			
4	Thickness (edges of the composite tile)	2.2.7	Level t [mm]
5	Slipperiness	2.2.8	Level α_{shod} [°]
6	Breaking strength	2.2.9	Level S [N] R [N/mm ²]
7	Impact resistance	2.2.10	Level Coefficient of restitution, e
8	Tactility	2.2.11	Description
Aspects of durability			
9	Resistance to thermal shock	2.2.4	Level n
10	Frost resistance	2.2.5	Level and description n_F
11	Chemical resistance (to high concentration of acids and alkalis)	2.2.6	Class

Table 2.1.2 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics (Use 2)

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	Water absorption of the ceramic tile	2.2.2	Level E_v [%]
3	Content, emission and/or release of dangerous substances. Substance group: - SVOC and VOC	2.2.3.2	Description and level Specific emission rates [$\mu\text{g}/(\text{m}^2\cdot\text{h})$] and air concentrations in the reference room [$\mu\text{g}/\text{m}^3$](*)
Basic Works Requirement 4: Safety and accessibility in use			
4	Thickness (edges of the composite tile)	2.2.7	Level t [mm]
5	Slipperiness	2.2.8	Level α_{shod} [°]
6	Breaking strength	2.2.9	Level S [N] R [N/mm ²]
7	Impact resistance	2.2.10	Level Coefficient of restitution, e
8	Tactility	2.2.11	Description
Aspects of durability			
9	Durability for internal uses	EN 14411 Table ZA.1.1 note G	Description
10	Chemical resistance (to high concentration of acids and alkalis)	2.2.6	Class

(*) accompanied by the information about the product loading factor used [m^2/m^3] (see Clause 1.3.1)

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.

2.2.1 Reaction to fire

Purpose of the assessment

The purpose of the assessment is the evaluation of the reaction to fire of the composite tiles.

Assessment method

The composite tile shall be tested according to the method(s) referred to in EN 13501-1 and relevant for the corresponding reaction to fire class. The product shall be classified according to the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

Provisions for the preparation of test specimens, the mounting and fixing conditions in the relevant test methods as well as the relevant parameters to be considered within the tests, together with the rules for extended application of test results, are reported in Annex A.

Expression of results

The determined class shall be given in the ETA.

2.2.2 Water absorption of the ceramic tile

Purpose of the assessment

The purpose of the assessment is the determination of the water absorption behaviour of the composite tiles by impregnation of porcelain ceramic tiles with water and then suspension in water. The part of the product subjected to test is the sole porcelain ceramic tile (see clause 1.1 for the product description) which is considered the key part with regard to this characteristic for a proper functioning of the product.

Assessment method

The determination of the water absorption shall be carried out according to EN ISO 10545-3. The term “tile” in the EN standard is to be intended as the porcelain ceramic tile part of the product.

Expression of results

The water absorption, E_v , expressed as a percentage of the dry mass [%], shall be given in the ETA.

2.2.3 Content, emission and/or release of dangerous substances

Purpose of the assessment

The performance of the composite tiles related to the emissions and/or release and, where appropriate, the content of dangerous substances will be assessed on the basis of the information provided by the

manufacturer³ after identifying the release scenarios taking into account the intended use(s) of the product and the Member States where the manufacturer intends his product to be made available on the market.

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

S/W1: Product with direct contact to soil, ground and surface water

S/W2: Product with indirect contact to soil, ground and surface water

IA1: Product with direct contact to indoor air

2.2.3.1 Leachable substances

This characteristic is only relevant for Use 1 (see clause 1.2.1).

For the intended use covered by the release scenarios S/W1 and/or S/W2, the performance of the composite tiles regarding leachable substances shall be assessed.

Assessment method

A leaching test with subsequent eluate analysis shall take place, each in duplicate. Leaching tests of the composite tiles shall be conducted according to 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/m².

Specimens shall be prepared according to 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 according to EN ISO 6341;
- toxicity test with algae according to EN ISO 15799;
- luminescent bacteria test according to EN ISO 11348-1, EN ISO 11348-2 or EN ISO 11348-3.

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

Expression of results

Determined toxicity in the leaching test (biological tests) of the composite tiles shall be expressed as EC20-values for each dilution ratio. Maximum determined biological degradability shall be expressed as "...% within ... hours/days ". The respective test methods for analysis shall be specified.

2.2.3.2 SVOC and VOC

This characteristic is only relevant for Use 2 (see clause 1.2.1).

For the intended use covered by the release scenario IA1, the performance of the composite tiles regarding SVOC and VOC shall be assessed.

Assessment method

Volatile organic compounds and semi-volatile organic compounds (respectively: VOC and SVOC) shall be determined in accordance with EN 16516. In particular, clause 8.2 of EN 16516 which describes the

³ The manufacturer may be asked to provide to the TAB the REACH related information which he must accompany the DoP with (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
- to provide a written declaration to the TAB stating whether the product (or constituents of the product) contain(s) substances which are classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the SGDS.

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

determination of VOCs and SVOCs in test chamber air, is of concern. The following loading factor for emission testing for the intended use “floor” is applicable according to EN 16516: 0,4 m²/m³.

The installation of the test specimen in the test chamber should be done in accordance with the manufacturer’s product installation instructions, whenever possible; in absence of such instructions, with the usual practice of the building professionals.

Expression of results

A description of specific emission rates [$\mu\text{g}/(\text{m}^2\cdot\text{h})$] and respective air concentrations in the reference room [$\mu\text{g}/\text{m}^3$] of the compounds, together with the information regarding the product loading factor used [m^2/m^3], in accordance with clause 10.6 of EN 16516, shall be reported in the ETA.

2.2.4 Resistance to thermal shock

Purpose of the assessment

The purpose of the assessment is the determination of the resistance to thermal shock of the composite tiles.

Assessment method

The assessment shall be carried out according to EN ISO 10545-9 and in particular to the test method with immersion of specimens in water as in EN ISO 10545-9 clause 6.2. With reference to clause 6.4 of EN ISO 10545-9, the following modifications are brought to the assessment method: as for the temperature, the oven shall be maintained at 80 °C \pm 5 °C; as for the duration, the specimens shall be kept in the oven for 40 minutes. The temperature of the oven indicated in clause 4.2 of the abovementioned standard is modified consistently with the temperature cycling for the test: the oven shall be capable of being operated at a temperature of (80 \pm 5) °C.

Expression of results

The number n of tested specimens with visible defects shall be given in the ETA.

2.2.5 Frost resistance

Purpose of the assessment

The purpose of the test is to assess the frost resistance of the composite tiles by subjection to freeze-thaw cycles after immersion in water.

Assessment method

The determination of the frost resistance of the composite tiles shall be carried out in accordance with EN ISO 10545-12. Regarding the drying of test specimens for specimens’ preparation with reference to clause 4.2 of EN ISO 10545-12, the temperature value in brackets (temperature of the oven necessary to bring the composite tile to a constant mass) is lowered to 80 °C \pm 5 °C. Therefore, with respect to what is stated in clause 3.1 of the abovementioned standard, the oven shall be capable of being operated at a temperature of (80 \pm 5) °C.

Expression of results

A description of any damage evidenced in the composite tiles and the number n_F of the damaged composite tiles after the envisaged number of cycles (100) shall be given in the ETA.

2.2.6 Chemical resistance (to high concentration of acids and alkalis)

Purpose of the assessment

The purpose of the test is to assess the resistance of the composite tiles to chemical agents by subjection to the action of the specified test solutions.

The resistance to chemicals shall be divided into the following types depending on the chemical solution:

- household chemicals
- swimming pool salts
- low concentration acids
- low concentration alkalis
- high concentration acids
- high concentration alkalis.

Assessment method

The resistance to chemical agents of the composite tiles shall be determined according to EN ISO 10545-13. The specimen shall be the whole composite tile and the procedure for the application of the test solution shall make use of the glass cylinder into which the solution will be poured and maintained in contact with the proper surface (the walking surface) of the composite tile. In addition to the number of specimens envisaged by EN ISO 10545-13 in Table 1 to be subjected to test in accordance with the above-described procedure, two extra specimens shall be tested with the procedure of partial immersion. In this latter case, when relevant (e.g., the polyurethane sides of the composite tile are equal two by two) the two test specimens shall be different to each other for the geometry of the polyurethane side. Each extra specimen will be square and shall be cut, according to clause 7.2, from a whole composite tile so as to present at least one polyurethane side. These square specimens shall be immersed vertically to a depth of 25 mm into the solution (in a suitable vessel) orientated in such a way that the polyurethane side results immersed (procedure of clause 8.1 of EN ISO 10545-13).

With reference to clause 8.1 of EN ISO 10545-13, the following modifications are brought to the assessment method: the temperature of the oven is maintained at 80 ± 5 °C for at least 4 h. Therefore, with respect to what is stated in clause 6.3 of the abovementioned standard, the oven shall be capable of being operated at a temperature of (80 ± 5) °C.

Expression of results

The resistance to chemicals, expressed in class according to EN ISO 10545-13, for each type of chemical solution, shall be given in the ETA.

2.2.7 Thickness (edges of the composite tile)

Purpose of the assessment

The purpose of the assessment is the determination of the thickness of the composite tiles.

Assessment method

The thickness shall be determined according to clause 5 of EN ISO 10545-2. With reference to the test apparatus, as a measuring tool it can also be appropriate an analogue/electronic centesimal comparator to be used on a rectified surface plate. Test procedure shall be in accordance with clause 5.3 with the modifications described hereafter. For composite tiles with non-planar, uneven surfaces, starting from one side two perpendicular lines shall be drawn across the face to the opposite side at the distance of 0,25 and 0,75 times the side length measured from one end. The thickness shall be measured at each end of the lines on two opposite sides of the composite tile, in the thickest point of the composite tile, for example along the edges of the composite tile.

The mean value of the thickness t for an individual composite tile is the result of 4 measurements; 10 composite tiles shall be measured to obtain the mean value of the thickness to be reported in the ETA.

Expression of results

The thickness mean value of the composite tile t [mm] shall be given in the ETA.

2.2.8 Slipperiness

Purpose of the assessment

The purpose of the assessment is the evaluation of the slip resistance of the pedestrian surface of the composite tiles.

Assessment method

The slipperiness of the composite tiles shall be determined according to EN 16165 - Method of Annex B “Shod Ramp Test”. In order to provide for a test area of the required dimensions according to the method of Annex B, for the loose laid floor covering constituted by the composite tiles a suitable retaining frame shall be used which is apt to hold the specimen in position (if necessary, large composite tiles shall be cut to meet the required dimensions of the test area).

Expression of results

The critical angle, α_{shod} , shall be given in the ETA.

2.2.9 Breaking strength

Purpose of the assessment

The purpose of the assessment is the determination of the breaking strength of the composite tiles by the application of a force at a specified rate to the centre of the porcelain ceramic tile. The part of the product (see clause 1.1 for the product description) subjected to test is the sole porcelain ceramic tile which is deemed to be determinant with respect to this essential characteristic.

Assessment method

The breaking strength of the composite tiles shall be determined according to EN ISO 10545-4. The term “tile” in EN ISO 10545-4 is to be intended as the porcelain ceramic tile part of the product.

Expression of results

The breaking strength, S [N] of each test specimen, and the mean value (arithmetic mean) of the breaking strength, S_m [N], shall be given in the ETA.

The mean value (arithmetic mean) of the modulus of rupture, R [N/mm²], shall be given in the ETA.

2.2.10 Impact resistance

Purpose of the assessment

The purpose of the assessment is the evaluation of the impact resistance of the composite tiles.

Assessment method

The impact resistance of the composite tiles shall be determined according to EN ISO 10545-5. For what concerns the test specimens, in the number and dimensions envisaged by EN ISO 10545-5 clause 5.1, they shall be cut, one from each composite tile under test, from a whole composite tile. Each specimen shall be cut, from the whole composite tile, so that it presents at least one polyurethane side (namely, a sector of the moulded polyurethane frame).

Expression of results

The mean value (arithmetic mean) of the coefficient of restitution (COR), e , shall be reported in the ETA.

2.2.11 Tactility

Purpose of the assessment

The purpose of the assessment is to evaluate the surface profile features and patterns of the composite tiles used to convey information for visually impaired people. This performance is only relevant when the end use application of the composite tiles is for tactile paving surfaces, i.e. when required for blind or vision impaired people.

Assessment method

The tactility of the composite tiles shall be assessed according to CEN/TS 15209. The dimensions of the layouts and profiles of the individual composite tiles shall be measured in accordance with Annex B of CEN/TS 15209. In Annex B of CEN/TS 15209, the reference to clause 4.3 of the same standard for the conformity check of the determined measures shall not be understood as a reference to threshold levels, since the applicable dimensions are those valid in the place of use in dependence on the requirements set therein.

Expression of results

The surface description, which will include the surface profile feature/s and the dimensions of the layouts and profiles of the ceramic multilayer slabs, shall be stated in the ETA as given in CEN/TS 15209. The surface description shall be based on the tactile layouts and profiles detailed in Figures from 1 to 19 of CEN/TS 15209 (as stated in clause 4.1 of CEN/TS 15209).

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 act is: Commission Decision 97/808/EC as amended by Commission Decision 2001/596/EC and Commission Decision 2006/190/EC.

The applicable AVCP system is 4 for any use except for uses subject to regulations on reaction to fire.

For uses subject to regulations on reaction to fire, the applicable AVCP systems regarding reaction to fire are 1, or 3, or 4 depending on the conditions defined in the said Commission Decision.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product 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	<i>Incoming component (Polyurethane – NCO (Isocyanate)) / percentage concentration m/m [%]</i>	Check of delivery ticket or label on the package	Conformity with the order	-	Each delivery
2	<i>Incoming component (Polyurethane - Polyol) / Pot life</i>	Check of delivery ticket or label on the package	Conformity with the order	-	Each delivery
3	<i>Incoming component (Polyurethane - Polyol) / Colour</i>	Visual check	According to the control plan	-	Each delivery
4	<i>Incoming component (Porcelain ceramic tile) / Measurement of length and width</i>	EN ISO 10545-2	According to the control plan	-	Each batch
5	<i>Incoming component (Porcelain ceramic tile) / Measurement of thickness</i>	EN ISO 10545-2	According to the control plan	-	Each batch
6	<i>Incoming component (Porcelain ceramic tile) / Measurement of rectangularity</i>	EN ISO 10545-2	According to the control plan	-	Each batch
7	<i>Incoming component (Porcelain ceramic tile) / Measurement of surface flatness</i>	EN ISO 10545-2	According to the control plan	-	Each batch
8	<i>Incoming component (Porcelain ceramic tile) / Surface quality</i>	EN ISO 10545-2	Conformity with the order	-	Each batch
9	<i>Finished product / Water absorption of the ceramic tile</i>	According to the control plan	According to the composite tile manufacturer's specifications	At least 3 specimens	According to manufacturer's control plan (*)
10	<i>Finished product / Chemical resistance (to high concentration of acids and alkalis)</i>	According to the control plan	According to the composite tile manufacturer's specifications	According to the control plan	According to manufacturer's control plan (*)
11	<i>Finished product / Breaking strength</i>	2.2.9	According to the composite tile manufacturer's specifications	At least 3 specimens	Once per 5 years
12	<i>Finished product / Reaction to fire</i>	2.2.1	According to the composite tile manufacturer's specifications	2.2.1	Once per 2 years
(*) The frequency is determined case by case depending on the variation in the volume produced over the time.					

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 carried out by the manufacturer regarding the constancy of performance related to reaction to fire and taking into account a limiting of organic material and/or the addition of fire retardants. <i>(for system 1 only)</i>					
1	Where the intervention of the Notified Body is necessary only because the conditions for the applicability of system 1 are fulfilled for reaction to fire, 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	As defined in the control plan	When starting the production or a new line
Continuous surveillance, assessment and evaluation of factory production control carried out by the manufacturer regarding the constancy of performance related to reaction to fire and taking into account a limiting of organic material and/or the addition of fire retardants. <i>(for system 1 only)</i>					
2	Where the intervention of the Notified Body is necessary only because the conditions for the applicability of system 1 in the Decisions regarding reaction to fire are fulfilled, 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	As defined in the control plan	Once per year

4 REFERENCE DOCUMENTS

CEN/TS 15209:2021	Tactile paving surface indicators produced from concrete, clay and stone
EN 13238:2010	Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates
EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
EN 14411:2012	Ceramic tiles - Definitions, classification, characteristics, evaluation of conformity and marking
EN 16165:2021	Determination of slip resistance of pedestrian surfaces – Methods of evaluation
EN 16637-2:2023	Construction products: Assessment of release of dangerous substances – Part 2: Horizontal dynamic surface leaching test
EN 16516:2017+A1:2020	Construction products: Assessment of release of dangerous substances – Determination of emissions into indoor air
EN ISO 6341:2012	Water quality. Determination of the inhibition of the mobility of <i>Daphnia magna</i> Straus (Cladocera, Crustacea). Acute toxicity test
EN ISO 9239-1:2010	Reaction to fire tests for floorings – Part 1: Determination of the burning behaviour using a radiant heat source
EN ISO 10545-2:2018	Ceramic tiles – Part 2: Determination of dimensions and surface quality
EN ISO 10545-3:2018	Ceramic tiles – Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density
EN ISO 10545-4:2019	Ceramic tiles – Part 4: Determination of modulus of rupture and breaking strength
EN ISO 10545-5:1997	Ceramic tiles – Part 5: Determination of impact resistance by measurement of coefficient of restitution
EN ISO 10545-9:2013	Ceramic tiles – Part 9: Determination of resistance to thermal shock
EN ISO 10545-12:1997	Ceramic tiles – Part 12: Determination of frost resistance
EN ISO 10545-13:2016	Ceramic tiles – Part 13: Determination of chemical resistance
EN ISO 11348-1:2008+A1:2018	Water quality. Determination of the inhibitory effect of water samples on the light emission of <i>Vibrio fischeri</i> (Luminescent bacteria test). Part 1: Method using freshly prepared bacteria
EN ISO 11348-2:2008+A1:2018	Water quality. Determination of the inhibitory effect of water samples on the light emission of <i>Vibrio fischeri</i> (Luminescent bacteria test). Part 2: Method using liquid-dried bacteria
EN ISO 11348-3:2008+A1:2018	Water quality. Determination of the inhibitory effect of water samples on the light emission of <i>Vibrio fischeri</i> (Luminescent bacteria test). Part 3: Method using freeze-dried bacteria
EN ISO 11925-2:2020	Reaction to fire tests – Ignitability of products subjected to direct impingement of flame – Part 2: Single-flame source test
EN ISO 15799:2022	Soil quality – Guidance on the ecotoxicological characterization of soils and soil materials

ANNEX A MOUNTING AND FIXING PROVISIONS AND EXTENDED APPLICATION RULES FOR TEST RESULTS OF THE RELEVANT REACTION TO FIRE TESTS

For the reaction to fire test for floorings, the test method is reported in EN ISO 9239-1. The ignitability test according to EN ISO 11925-2 (single-flame source test) is relevant for the reaction to fire classes B_{fi}, C_{fi}, D_{fi} and E_{fi} of floorings according to EN 13501-1, Table 2, and shall be executed in combination with the reaction to fire test for floorings.

The composite tiles present a polyurethane frame and a porcelain ceramic tile bonded together. For EN ISO 9239-1 test, for what concerns test specimens it shall be considered that 1 test shall be conducted, with respect to the direction of the centre axis of the specimen holder, with lengthwise orientation of the polyurethane frame in the highest distance to the zero point of the specimen (see Fig. 6 of EN ISO 9239-1 for the position of zero point of the specimen; see Fig. A.1 of this Annex A for the scheme of the test specimen – specimen 1), 1 test with crosswise (perpendicular) orientation of the frame in the highest distance to the zero point of the specimen (same as in Fig. A.1 for the distance to the zero point but with the composite tiles orientated at 90° - specimen 2) and 1 test with crosswise (perpendicular) orientation of the frame in a low distance (250 mm) to the zero point of the specimen (see Fig. A.2 – specimen 3). According to clause 8.2.6 of EN ISO 9239-1, note which of the tested specimens yields the lower CHF and/or HF-30 value(s), calculated in accordance with clause 9 of EN ISO 9239-1, and repeat the test on the two further specimens that have been cut and laid in that direction. If the composite tiles need be cut in order to meet the specimen dimensions envisaged by EN ISO 9239-1 in clause 6.1, they shall be cut so that they present two polyurethane sides out of four.

For EN ISO 11925-2 test, the frame shall be positioned with lengthwise orientation with respect to the centre axis of the specimens for at least two tests of each flame exposure type.

The specimen will represent the composite tiles in their end use. If in end use application the composite tiles are mounted directly on a substrate which can be for example a pre-existing floor (or a ground substrate), thus the specimen shall be tested with a representative substrate for floorings (substrate which is appropriate to represent the actual end-use situation in fire tests) directly behind it, selected in accordance with EN 13238. The test specimens shall be tested loose laid on standard substrates according to EN 13238, of the classes A1, A2-s1,d0 (for example: fibre cement boards in accordance with clause 5.2.2 of EN 13238) and A2_{fi}-s1, using the clamps of the standard specimen holder for fixing purposes.

The specimen shall be conditioned as specified in EN 13238.

The parameters which shall be considered when preparing the test specimens for the reaction to fire test are listed hereafter.

Each different composition and assembly (that is, the design of joints) of the composite tiles shall be tested and assessed separately.

The lowest and the highest thickness and weight per unit area (if any) of the product are to be taken into account.

The specimens shall be tested loose-laid (the product in final use is dry installed) on the selected substrate according to EN 13238.

For products / tiles of total thickness > 10 mm, clause 7.3.3.2.3 of EN ISO 11925-2 (multi-layer products) is to be taken into account, and an additional set of tests shall be executed with the specimen rotated by 90 degrees around its vertical axis.

The smallest size of the composite tiles in the available range shall be taken for preparing the test specimens.

If a range of different colours (but no difference in the chemical composition) is available for the product, tests shall be performed with specimens of the darkest colour, of the lightest colour and of a medium colour within the range.

As for generic aspects regarding orientation, the specimen shall be mounted and tested with lengthwise as well as with crosswise orientation, if relevant.

The results of tests taking into consideration the aforementioned parameters are valid for:

- the same chemical composition and assembly as tested,
- the complete range of colours,
- any thickness between those evaluated,
- any weight per unit area between those evaluated,
- any orientation.

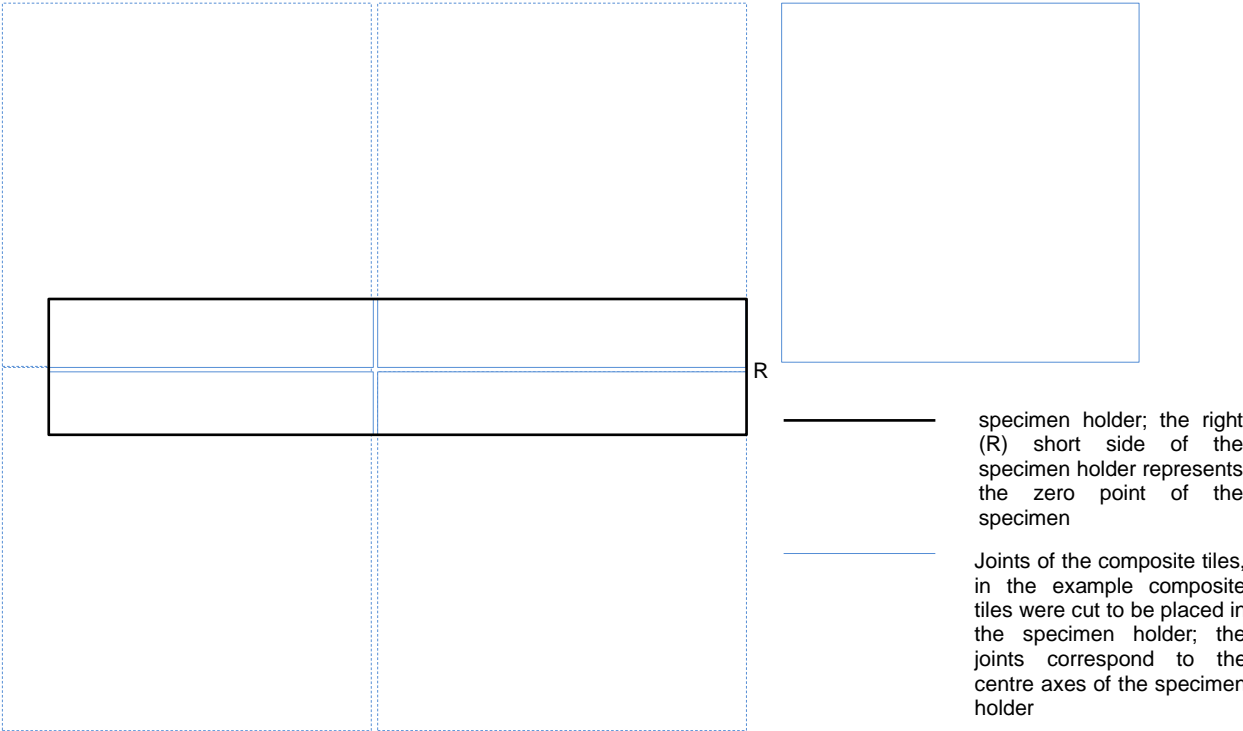
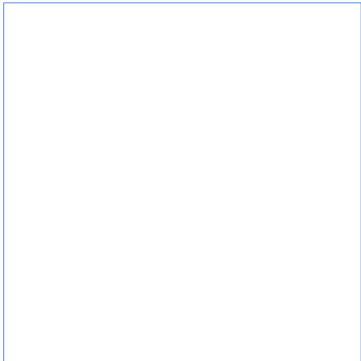
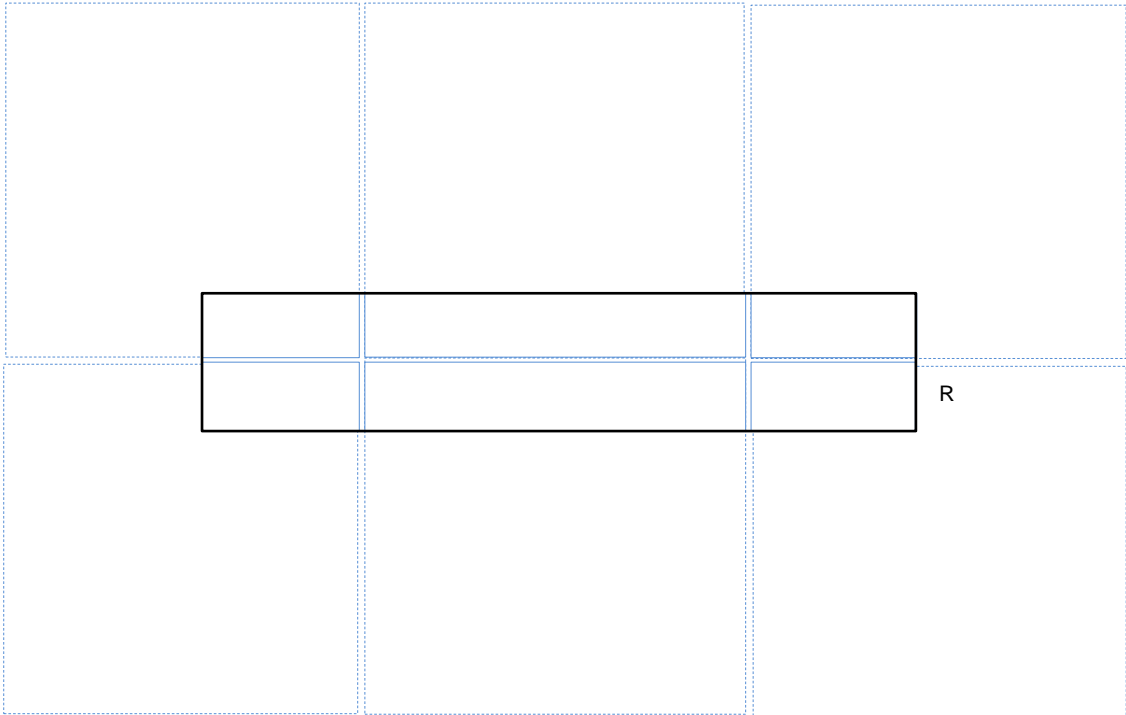


Figure A.1: Scheme of test specimens 1 and 2



- specimen holder; the right (R) short side of the specimen holder represents the zero point of the specimen
- Joints of the composite tiles, in the example composite tiles were cut to be placed in the specimen holder; the joints correspond to the centre axes of the specimen holder

Figure A.2: Scheme of test specimen 3