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European Assessment Document for

Flexible polymer modified mineral thick coatings



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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

This EAD covers flexible polymer modified mineral thick coatings for waterproofing of buildings (FPMC).

Generally, the FPMC is applied in two layers. The total minimum dry film thickness of both layers depends on the water load that the waterproofing is exposed to as well as the installation situation within a construction, as described in Table 1.2.1.1.

The FPMC is either an individual product or it can be put on the market in combination with ancillary products, such as sealing tapes and sleeves. These ancillary products are not covered by this EAD but can contribute to the watertightness of the FPMC in case pipes, sealing drains/gullies and/or corners are present in the building.

The product is not fully covered by the following harmonised technical specification: EN 15814¹. The existing harmonised technical specification covers only bituminous coatings and does not cover all essential characteristics needed for the assessment of FPMC: dry film thickness, water vapour transmission, carbon dioxide permeability, resistance to freeze-thaw, watertightness (both function test and basin test). Therefore such characteristics are included in Table 2.2.1.

In addition, FPMC do not need to be tested for what concerns the determination of dimensional stability at high temperature according to EN 15818 because FPMC, differently from bituminous coatings, are not susceptible to melting at the temperatures described in EN 15818 (70 °C) or even higher temperatures that occur naturally.

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 FPMC is intended to be used for waterproofing of buildings in new and existing buildings or partial roof repair.

Table 1.2.1.1 Intended use(s)

water load / installation situation	description	total minimum dry layer thickness
horizontal waterproofing under walls		2,0 mm
splash water	waterproofing of plinth area	2,0 mm
damp ground and non-standing seepage water	minimum water load of building elements exposed to soil	2,0 mm
moderate water pressure	waterproofing against external water pressure up to 3 m below ground water level	2,5 mm
heavy water pressure	waterproofing against external water pressure up to 8 m below ground water level	4,0 mm
waterproofing of joints in prefabricated concrete units		4,0 mm

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

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 FPMC for the intended use of 25 years when installed in the works (provided that the FPMC 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.

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 FPMC 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	Dangerous substances	EN 15814, clause 4.2	description
Basic Works Requirement 4: Safety and accessibility in use			
3	Dry film thickness	2.2.2	level
4	Crack-bridging ability	2.2.3	class according to EN 15814
5	Water vapour transmission	2.2.4	level
6	Carbon dioxide permeability	2.2.5	level
7	Flexibility at low temperatures	2.2.6	description
8	Resistance to freeze-thaw	2.2.7	description
9	Resistance to compression	EN 15815	class according to EN 15814
10	Resistance to rain	EN 15816	class according to EN 15814
11	Water resistance	2.2.8	description
12	Resistance to water storage	2.2.9	description
13	Watertightness (slit pressure test)	2.2.10	description
14	Watertightness (function test)	2.2.11	description
15	Watertightness (basin test)	2.2.12	description
16	Durability of watertightness and reaction to fire	EN 15814	level according to EN 15814

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 assessment is performed to determine the FPMC's reaction to fire.

Assessment method

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

The mounting and fixing conditions from EN 15814, Annex A apply with the FPMC taking the place of the PMBC.

Expression of results

Class according to EN 13501-1 shall be stated in the ETA.

2.2.2 Dry film thickness

Purpose of the assessment

The assessment is performed to determine the FPMC's dry film thickness and corresponding consumption of material.

Assessment method

The determination of dry film thickness is carried out by the following provisions:

The test shall be performed on two individual specimens.

The FPMC shall be applied to a glass plate 30 x 30 cm² with an application thickness of 4 mm. The consumption shall be measured.

After 7 days of hardening and storage at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity, the dry film thickness shall be determined to a precision of 0,1 mm with a minimum of five individual measurements per specimen.

Expression of results

The arithmetic average and standard deviation as well as the consumption per mm dry film thickness shall be stated in the ETA.

2.2.3 Crack-bridging ability

Purpose of the assessment

The assessment is performed to determine the product's behaviour when cracks form in the substrate.

Assessment method

The determination of the crack-bridging properties shall be performed according to EN 15812, test method A or B.

Expression of results

The applied class according to EN 15814 and test method according to EN 15812 shall be stated in the ETA.

2.2.4 Water vapour transmission

Purpose of the assessment

The assessment is performed to determine the FPMC's water vapour transmission properties.

Assessment method

The determination of the water vapour transmission properties shall be performed according to EN ISO 7783, conditioning method B.

The dry cup method shall be used.

The preparation of the three specimens shall be as follows:

The specimens shall be with a minimum dry film thickness of 2 mm.

Expression of results

The water vapour diffusion resistance factor μ shall be stated in the ETA.

2.2.5 Carbon dioxide permeability

Purpose of the assessment

The assessment is performed to determine the FPMC's carbon dioxide permeability.

Assessment method

The determination of the carbon dioxide permeability shall be performed according to EN 1062-6, test method A.

The specimens shall be produced with a minimum dry film thickness of 2 mm.

After preparation, the specimens shall be stored at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for 28 days.

Expression of results

The value of the diffusion resistance factor μ shall be stated in ETA.

2.2.6 Flexibility at low temperatures

Purpose of the assessment

The assessment is performed to determine the FPMC's flexibility at low temperatures.

Assessment method

The resistance of a free film of the FPMC, produced in the required minimum film thickness according to table 1.2.1.1, shall be tested for cracking during a bending test at low temperatures.

The test shall be performed in accordance with EN 15813.

In case of cracks, their number shall be recorded and the maximum crack width shall be determined to a precision of 0,1 mm.

Expression of results

Any cracks, their maximum width and their number shall be stated in the ETA.

If no cracks appeared, "no cracks" shall be stated in the ETA.

Additionally, the film thickness in mm shall be stated in the ETA.

2.2.7 Resistance to freeze-thaw

Purpose of the assessment

The assessment is performed to determine the FPMC's resistance to freeze-thaw.

Assessment method

The freeze-thaw resistance is determined by testing the bond strength of the FPMC after freeze-thaw cycles.

The determination of the bond strength shall be performed according to EN 1542. The following provisions apply:

A substrate of concrete according EN 1542 shall be coated with the FPMC. Prior to coating, the substrate shall be stored at a temperature according to the minimum processing temperature specified by the manufacturer for 24 h.

The number of specimens shall be three substrates for five bond strength tests each. One specimen serves as reference.

The application shall be as follows:

The conditions during coating shall be at minimum processing temperature specified by the manufacturer with a minimum dry film thickness of 2 mm.

The sides and the back side of the specimens shall be sealed.

After coating, the specimens shall be stored at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for 28 days.

Subsequently, the specimens shall be exposed to 25 freeze-thaw cycles.

The following provisions apply for each freeze-thaw cycle:

1. Store the specimens in air at (15 ± 3) °C, lower temperature to (-15 ± 3) °C within $2 \text{ h} \pm 20 \text{ min}$ ³
2. Store specimens in air at (-15 ± 3) °C for $2 \text{ h} \pm 20 \text{ min}$
3. Store specimens in water (15 ± 3) °C maintain temperature for $2 \text{ h} \pm 20 \text{ min}$ at (15 ± 3) °C

During interruptions in the cycles (e.g., weekends), the specimens shall be stored in water at (15 ± 3) °C.

After the freeze-thaw cycles, the reference specimen shall be stored at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for (24 ± 2) h. Subsequently, the test for bond strength shall be performed according to EN 1542 on all specimens.

³ This can be achieved with a constant temperature change of ($-0,25 \pm 0,05$) °C/min.

The mean failure resistance is based on the results of ten tests.

Expression of results

The mean value of the bond strength in N/mm² of the freeze-thaw specimens and the reference specimen shall be stated in the ETA.

The minimum processing temperature used shall also be stated in the ETA.

2.2.8 Water resistance

Purpose of the assessment

The assessment is performed to determine the FPMC's resistance to water.

Assessment method

The determination of the water resistance shall be performed according to EN 15817 with a minimum film thickness of 4 mm.

Expression of results

Any colouring of run-off water and deteriorations in appearance corresponding to testing time shall be stated in the ETA.

If no colouring of run-off water or deteriorations in appearance occur, "resistant to water" with the corresponding testing time shall be stated in the ETA.

2.2.9 Resistance to water storage

Purpose of the assessment

The assessment is performed to determine the FPMC's resistance to water storage.

The time-dependent bond strength provides information on the durability of the FPMC.

Assessment method

Substrates of water-resistant concrete shall be produced according to Annex A with dimensions of 500 mm x 250 mm x 40 mm.

The application of three specimens shall be as follows:

The FPMC shall be applied in two stripes parallel to the longitudinal direction (see Figure 2.2.9.1). The width of each stripe shall be 7 cm. The films shall have a minimum dry film thickness of 4 mm.

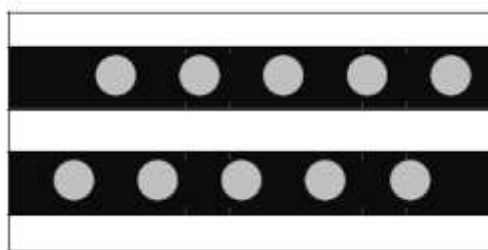


Figure 2.2.9.1: Sketch of principle

After application, the specimens shall be stored at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for the curing time of 28 days.

Afterwards, two specimens shall be stored in tap water at (23 ± 2) °C as ageing process and one specimen at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity as a reference.

The determination of the bond strength shall be performed according to EN 1542. The following provisions apply:

The reference specimen shall be tested directly after the curing time and 56 days after the curing time.

After 7/14/28/56 days of ageing the other specimens shall be tested. At each interval, five measurements shall be taken. After removing the specimens from the water, the surface shall be carefully dabbed and dried at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for 24 hours. Specimens with untested stripes of FPMC shall be stored in water again until the following test period.

The mean values of bond strength are plotted in a diagram as a function of time and are evaluated according to the following criteria:

- no decrease in bond strength which could indicate a time dependant failure,
- no detachment or formation of blisters,
- the bond strength after 56 days of water storage.

A time dependant failure occurs when both of the following criteria are met for the specimens aged in tap water:

- the mean value of the bond strength after 56 d is reduced by ≥ 30 % compared to the mean value of bond strength after 7 d,
- the coefficient of determination R^2 of the regression line of mean values of bond strength after 7, 14, 28 and 56 d is $\geq 0,9$.

Expression of results

The mean value of the bond strength in N/mm² after 56 days of water storage and any detachments or formation of blisters shall be stated in the ETA.

Additionally, if the criteria for a time dependant failure are met, “time dependant failure” shall be stated in the ETA.

2.2.10 Watertightness (slit pressure test)

Purpose of the assessment

The assessment is performed to determine the FPMC’s watertightness.

Assessment method

The determination of the watertightness shall be performed according to EN 15820.

The three specimens shall be produced with minimum film thickness of 2 mm.

After preparation, the specimen shall be stored at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for 28 days.

The test shall be performed at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity. The pressure shall be 2 bars, the slit width shall be 5 mm and test duration 24 h.

Expression of results

In case the FPMC is watertight, “watertight” shall be stated in the ETA.

In case the FPMC is not watertight, “not watertight” shall be stated in the ETA.

2.2.11 Watertightness (function test)

Purpose of the assessment

The assessment is performed to determine the FPMC’s watertightness in end use conditions.

Assessment method

Cuboid parts made of concrete shall be used as substrates.

To simulate a joint lying in a plane, the two individual parts shall be assembled so that an adjustable joint gap is created between them (see Figure 2.2.11.1). The joint gap opening can be created using special wedges.

The concrete to produce the substrates shall meet the criteria specified in Annex A. The minimum dimensions for the entire substrate shall be 1,0 m x 0,7 m x 0,3 m (length x width x height).

The substrates shall be produced in moulds made of non-water-absorbent (e.g., steel, aluminium) material with corresponding compaction as for real-world use (e.g., vibration method).

Subsequently, the substrates shall be protected from drying out for at least three days and stored for at least 28 days at standard atmosphere (23 ± 2 °C and (50 ± 5) % relative humidity before application.

The substrate shall further be sandblasted or shot-peened until all cement slurries are removed and the surface of the granular structure is exposed, or in accordance with manufacturer specifications.

The FPMC shall be applied with a minimum dry film thickness of 4 mm, with a width of 250 mm and a minimum length of 700 mm across the joint.

After the complete application of the FPMC and a curing time of 28 days, gauges shall be mounted over the joint to monitor the joint width. Then the joint will be opened evenly by a specified width of 1,0 mm at room temperature.

A pressure chamber shall be placed above the system to be tested and sealed against the substrate. The pressure chamber must project transversely to the longitudinal direction of the joint at least 50 mm beyond the FPMC, i.e., the water attack can be conducted on both sides of the sealing system across a concrete strip at least 50 mm wide.

The edges of FPMC in the longitudinal direction of the joint must project beyond the pressure chamber (see Figure 2.2.11.1).

After bracing the pressure chamber with the specimen in place and filling the hollow cavity created above the FPMC with water, the test shall be carried out with water pressure according to Table 2.2.11.1. The water pressure shall be maintained for 28 days.

Table 2.2.11.1: Intended uses with the corresponding water pressure

water load / installation situation	description	total minimum dry layer thickness/ water pressure
horizontal waterproofing under walls		2,0 mm / -
splash water	waterproofing of plinth area	2,0 mm / -
damp ground and non-standing seepage water	minimum water load of building elements exposed to soil	2,0 mm / -
moderate water pressure	waterproofing against external water pressure up to 3 m below ground water level	2,5 mm / 0,75 bar
heavy water pressure	waterproofing against external water pressure up to 8 m below ground water level	4,0 mm / 2,00 bar
waterproofing of joints in prefabricated concrete units		4,0 mm / 0,75 bar

Subsequently, the determination of the bond strength shall be performed according to EN 1542 in areas subjected to water attack on both sides of the joints (see Figure 2.2.11.2).

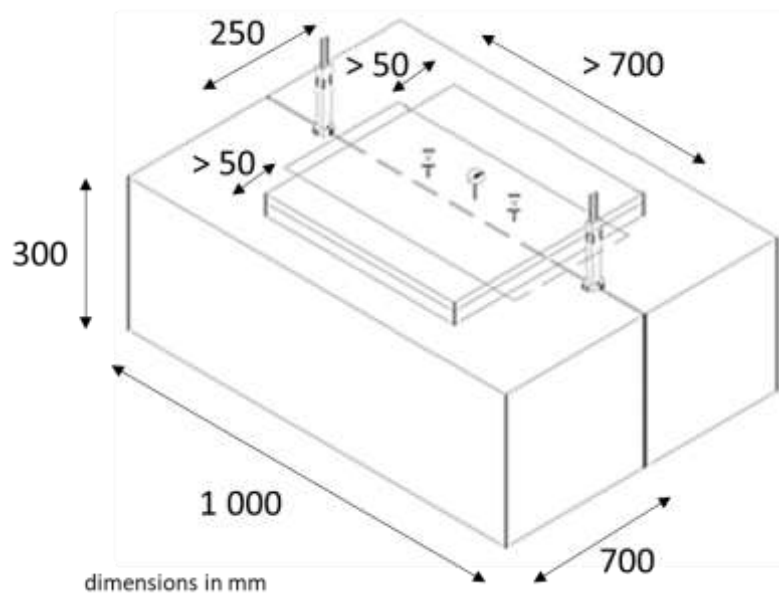
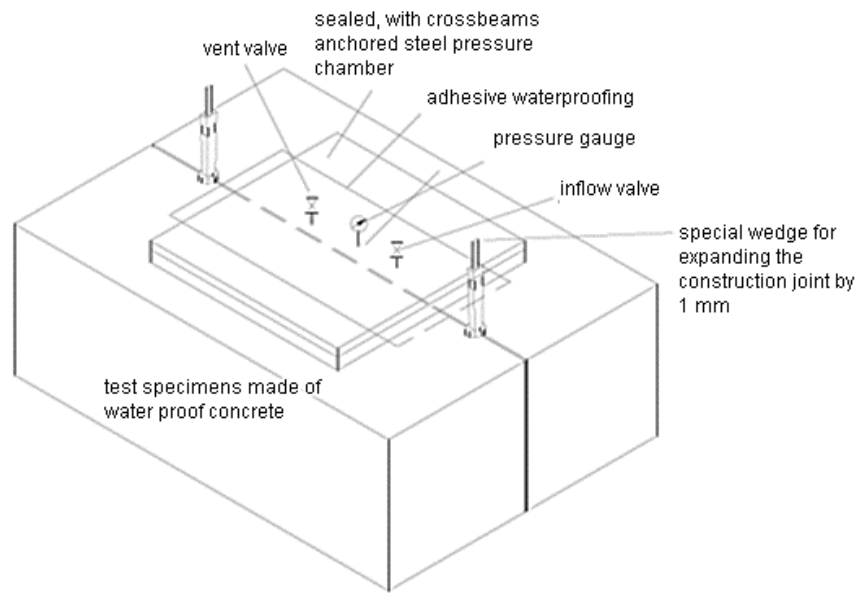


Figure 2.2.11.1: Sketch of principle

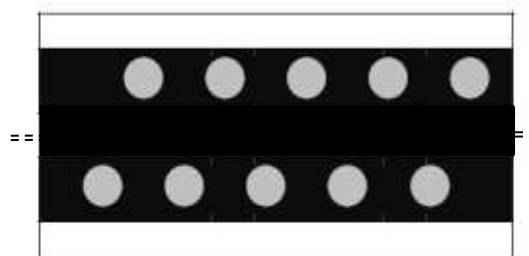


Figure 2.2.11.2: Sketch of principle

Expression of results

Any waterflows, wet areas (especially in the joint), detachments at the edges and/or blistering occurred during testing shall be stated in the ETA.

Only waterflows and wet areas caused by a failure of the FPMC shall be considered.

If no waterflows, wet areas, detachments at the edges or blistering occurred during testing, “watertight” shall be stated in the ETA.

Additionally, the mean value of the bond strength in N/mm² shall be stated in the ETA.

2.2.12 Watertightness (basin test)

Purpose of the assessment

The assessment is performed to determine the watertightness in end use conditions of FPMC together with ancillary products, if envisaged. It allows to check the behaviour of FPMC in multiple different situations in a singular test, simulating real construction situations (e.g., reinforcement sleeves in corners, presence of penetration pipes and floor drains/gullies, overlaps, etc.).

Assessment method

To assess the watertightness of the FPMC, including ancillary products, if and how envisaged by the manufacturer, a container structure shall be lined in accordance with Figure 2.2.12.1.

If penetrations are not expected (e.g., excluded in the provisions of the manufacturer), the test shall be conducted without any pipes and/or floor drains (see Figure 2.2.12.1). If the sealing tapes and/or sleeves connecting the FPMC to the penetration pipes and to the floor drains/gullies are installed in the same way, the pipe penetration may be omitted.

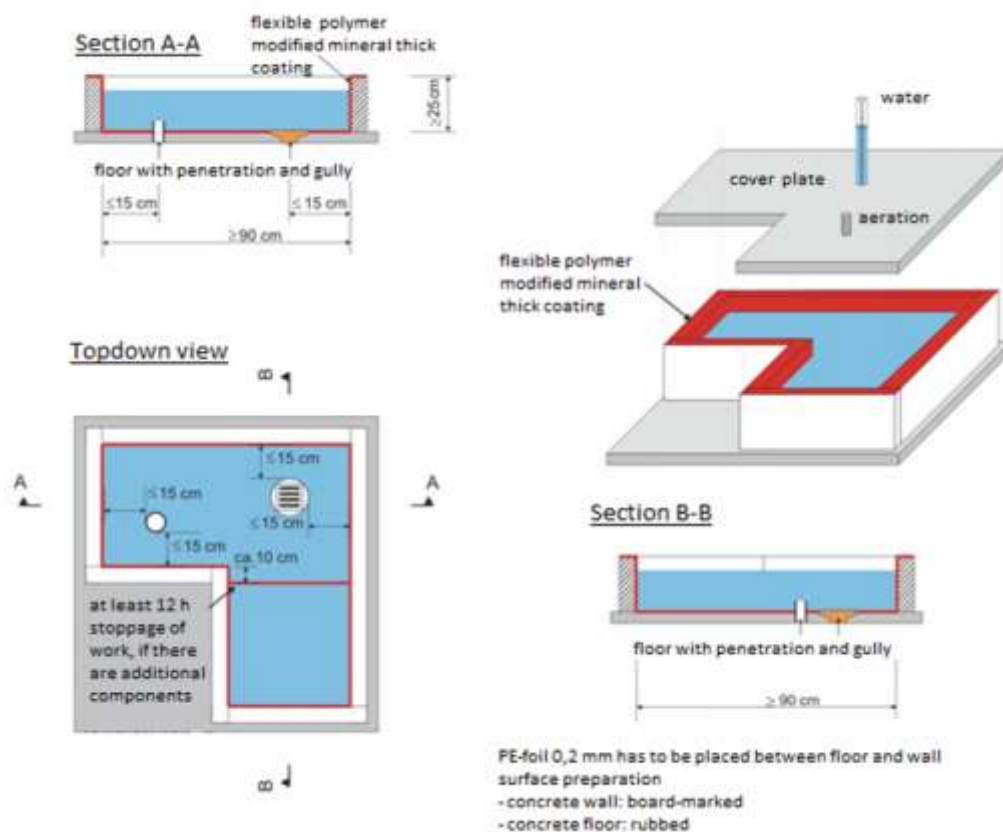


Figure 2.2.12.1: Principle of construction for determining watertightness when installed

The basin coating shall have a work stoppage of at least 12 hours. The work stoppage is intended to simulate the connection in the floor and wall planes as shown in Figure 2.2.12.1.

The container shall be filled with water after a curing time of 28 days. The layer thickness shall be according to Table 1.2.1.1.

The test pressure shall be increased with the respective testing periods according to Table 2.2.12.1 during which the pressure shall be held.

Table 2.2.12.1: Test pressures and the respective testing period

test pressure	corresponding water pressure up to ...m below ground water level	test period
2 kPa	-	28 days
50 kPa	2	7 days
75 kPa	3	7 days
100 kPa	4	7 days
150 kPa	6	7 days
200 kPa	8	7 days

The applicable water pressures in relation to the water load / installation situation are given in Table 2.2.12.2.

Table 2.2.12.2: Applicable water pressures in relation to the water load/installation situation

water load / installation situation	applicable water pressure during testing
horizontal waterproofing under walls	2 kPa
splash water	
damp ground and non-standing seepage water	
moderate water pressure	2 kPa - 75 kPa
heavy water pressure	2 kPa - 200 kPa
waterproofing of joints in prefabricated concrete units	2 kPa - 75 kPa

Expression of results

Any leakage (e.g., between the floor and wall, at penetrations) and corresponding pressure shall be stated in the ETA.

Only leakage caused by a failure of the FPMC shall be considered. If no leakage occurred, "watertight" with the corresponding pressure shall be stated in the ETA.

Additionally, the used ancillary products and their application details 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 act is Commission Decision 1999/90/EC, as amended by Commission Decision 2001/596/EC.

The system is 3.

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 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	Infrared spectrum - liquid components - cured product	EN 1767	The position and relative intensity of the absorption bands must correspond to those of the reference spectrum.	1	twice per year
2	Thermogravimetry - liquid components - cured product	EN ISO 11358-1	Confirmation by comparison and: ± 5 regarding to the loss of mass at 600 °C	1	twice per year
3	Density - liquid components	EN ISO 2811-1	according to EN 15814	according to EN 15814	according to EN 15814
4	Density - pulver components	EN 459-2	according to EN 15814	according to EN 15814	according to EN 15814
5	Density - cured product	EN ISO 1183-1, Method A	according to EN 15814	according to EN 15814	according to EN 15814
6	Viscosity - liquid components - fresh mix	EN ISO 3219-2	$\pm 20 \%$	1	twice per year
7	Non-volatile-matter content - liquid components	EN ISO 3251	according to EN 15814	according to EN 15814	according to EN 15814
8	Ash content at $(475 \pm 25) \text{ }^\circ\text{C}$ - liquid components with $\geq 5 \%$ ash content	EN ISO 3451-1, Method A	according to EN 15814	according to EN 15814	according to EN 15814
9	Granulometry analysis (only for two component materials)	EN 12192-1	> 2 mm: $\pm 6 \%$ absolute 0,063 - 2 mm: $\pm 4 \%$ absolute < 0,063 mm: $\pm 2 \%$ absolute	1	twice per year
10	Flexibility at low temperatures	EN 15813	according to EN 15814	according to EN 15814	according to EN 15814
11	Watertightness (slit pressure test)	clause 2.2.9	laid down in control plan	3	twice per year
12	Resistance to rain	EN 15816	laid down in control plan	2	twice per year
13	Reaction to fire	clause 2.2.1	class according to clause 2.2.1	see clause 2.2.1	once per two years

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 tasks 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 <i>(for systems 1+, 1 and 2+ 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 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 <i>(for systems 1+, 1 and 2+ 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 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

4 REFERENCE DOCUMENTS

EN 459-2:2021	Building lime - Part 2: Test methods.
EN 1062-6:2002	Paints and varnishes – Coating materials and coating systems for exterior masonry and concrete – Determination of carbon dioxide permeability.
EN 1542:1999	Products and systems for the protection and repair of concrete structures – Test methods – Measurement of bond strength by pull-off.
EN 1767:1999	Products and systems for the protection and repair of concrete structures – Test methods – Infrared analysis.
EN 12192-1:2002	Products and systems for the protection and repair of concrete structures – Granulometry analysis.
EN 13501-1:2018	Fire classification of construction products and building elements – Part 1: Classification using data from reaction of fire tests
EN 15812:2011	Polymer modified bituminous thick coatings for waterproofing – Determination of crack bridging ability.
EN 15813:2011	Polymer modified bituminous thick coatings for waterproofing – Determination of flexibility at low temperatures.
EN 15814:2011 +A2:2014	Polymer modified bituminous thick coatings for waterproofing – Definitions and requirements.
EN 15815:2011	Polymer modified bituminous thick coatings for waterproofing – Resistance to compression.
EN 15816:2011	Polymer modified bituminous thick coatings for waterproofing – Resistance to rain.
EN 15817:2011	Polymer modified bituminous thick coatings for waterproofing – Water resistance.
EN 15818:2011	Polymer modified bituminous thick coatings for waterproofing - Determination of dimensional stability at high temperature
EN 15820:2011	Polymer modified bituminous thick coatings for waterproofing - Determination of watertightness
EN ISO 1183-1:2019	lastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method.
EN ISO 2811-1:2023	Paints and varnishes - Determination of density - Part 1: Pycnometer method.
EN ISO 3219-2:2021	Rheology - Part 2: General principles of rotational and oscillatory rheometry.
EN ISO 3251:2019	Paints, varnishes and plastics – Determination of non-volatile-matter content.
EN ISO 3451-1:2019	Plastics - Determination of ash - Part 1: General methods.
EN ISO 7783:2018	Paints and varnishes – Determination of water-vapour transmission properties – Cup method
EN ISO 11358-1:2022	Plastics – Thermogravimetry (TG) of polymers – General principles.

ANNEX A: PRODUCTION OF SUBSTRATES OF WATER-RESISTANT CONCRETE

Substrates of water-resistant concrete shall be produced according to the following specifications:

cement:	CEM I 32,5 R
cement content:	320 kg/m ³
aggregates:	quartz, maximum grain size 16 mm, powder content > 350 kg/m ³ , fuller distribution
water-cement-ratio:	0,5
admixtures:	concrete-plasticizer or superplasticizer
flow spread:	450 mm (10 minutes after mixing)
size:	500 mm x 250 mm x 40 mm

After casting, the substrates shall be cured for three days and stored at standard atmosphere (23 ± 2) °C and (50 ± 5) % relative humidity for 21 days.

Prior to the application of the FPMC, the substrates shall be shot-blasted or sand-blasted to remove the cement skin and superficial exposure of the aggregates.