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European Assessment Document for

Corrosion protection systems with tapes wrapped for metallic load-bearing components



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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 corrosion protection systems with tapes wrapped for metallic load-bearing components (in the following referred to as corrosion protection system) are kits that consists of at least two layers of butyl rubber tapes (usually, double-sided tape as base layer and one-sided tape with UV-protection film as top layer) wrapped around metallic load-bearing components by means of a fully automated wrapping robot or with a hand-operated wrapping device with an overlap of about 50 %. In the overlapping areas a cold-welding of the tapes is achieved by interdiffusion of the rubber molecules over the layer boundaries leading to a closed mechanically resistant tube-like sheath to avoid inadmissible access of water vapour and oxygen.

Figure 1.1.1 shows a schematic diagram of the corrosion protection system.

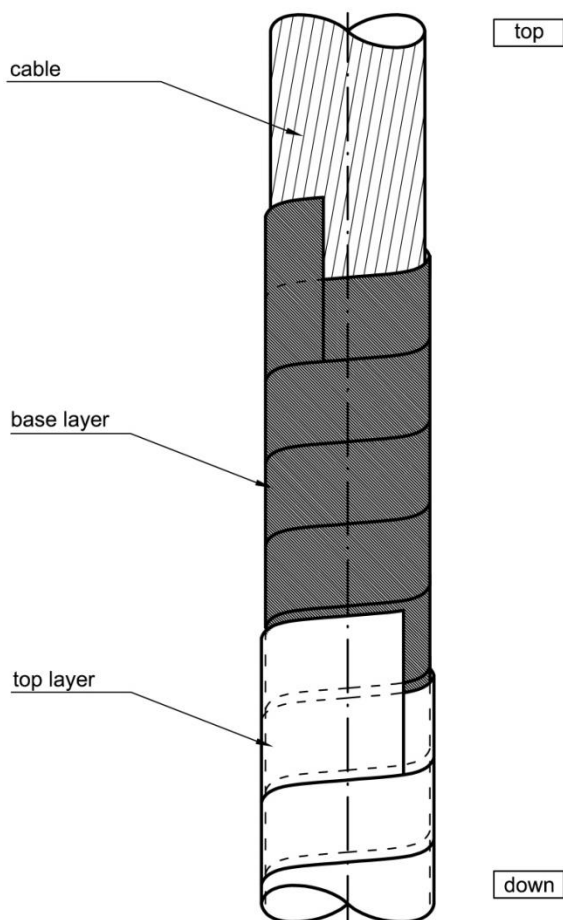


Figure 1.1.1: Schematic diagram of the corrosion protection system

The product is not covered by a harmonised European standard (hEN).

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 corrosion protection system is intended to be used for metallic load-bearing components with round or oval cross-section such as bridge cables and other load-bearing cables, pipes, rods or convex bars, bracings and is intended to be used for internal and external applications¹ as a long-term¹ corrosion protection system for initial corrosion protection as well as for replacement or strengthening of old corrosion protection systems. The intended use covers load-bearing components that are made of carbon steel or hot-dip galvanized steel.

The corrosion protection system can also be used as coating for UV protection¹, e.g., of a load-bearing cable surface or to prevent the leakage of cable backfilling material at the free cable length.

It can also be used for more than one parallel load-bearing cable together with humidity removal systems where the remaining air space in and between the cables is exposed to dry gas.

The corrosion protection system can be used up to very high corrosion stresses¹ (up to the corrosivity category C5¹ according to EN ISO 12944-2²). However, the highest corrosivity category (atmospheric environment) covered by the intended use shall be specified in the ETA and considered in the assessment methods, wherever applicable (see clause 2.2).

The corrosion protection system is intended to be used in accordance with the durability range "high" of EN ISO 12944-1 which corresponds with the working life 25 years as given in clause 1.2.2 of this EAD. Thus, the durability range "high" shall be considered in the assessment methods, wherever applicable (see clause 2.2).

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 corrosion protection system for the intended use of 25 years when installed in the works (provided that the corrosion protection system is subject to appropriate installation (see clause 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 works³.

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 If applicable, depending on the specific product to be assessed, its specific intended use and its performance.

² 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.

³ 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 corrosion protection system 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 1: Mechanical resistance and stability			
1	Resistance to neutral salt spray	2.2.1	level/description
2	Resistance to water condensation	2.2.2	level/description
3	Resistance to humid atmospheres containing sulphur dioxide	2.2.3	level/description
4	Resistance to artificial weathering by xenon radiation	2.2.4	level/description
5	Resistance to artificial weathering by UV radiation	2.2.5	level/description
6	Resistance to water vapour transmission	2.2.6	level
Basic Works Requirement 2: Safety in case of fire			
7	Reaction to fire	2.2.7	class

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.

If for any components covered by harmonised standards or European Technical Assessments the manufacturer of the component has included the performance regarding the relevant essential characteristic in the Declaration of Performance, retesting of that component for issuing the ETA under the current EAD is not required.

2.2.1 Resistance to neutral salt spray

Assessment method

The test shall be conducted in accordance with EN ISO 9227, neutral salt spray – NSS, for a specific exposure period in hours (i.e., 1440, 720 or 480 h) according to EN ISO 12944-6, table 1, column "neutral salt spray", that corresponds with the durability range "high" of EN ISO 12944-1 (see clauses 1.2.1 and 1.2.2) and with the highest corrosivity category (atmospheric environment) of EN ISO 12944-2 covered by the intended use, see clause 1.2.1.

The test specimens shall be three plain carbon steel cylinders (carbon steel substrate in accordance with EN ISO 12944-6, clause 5.1.1 but as a hollow cylinder with closed ends instead of a panel⁴) and three hot-dip galvanized cylinders (hot-dip galvanized steel substrate in accordance with EN ISO 12944-6, clause 5.1.2 but as a hollow cylinder with closed ends instead of a panel), with a diameter of 60 ± 1 mm and a length ≥ 210 mm, wrapped with the corrosion protection system and provided with one scribe line, see figure 2.2.1.1. The closed, not wrapped ends of the metal cylinders and the 20 mm-wide end-rings of the cylindrical surface (adjacent to the closed ends) shall be sealed before wrapping the corrosion protection system (e.g., with a thick solvent free epoxy coating or with fully bonded plastic caps) to prevent any corrosion in these areas during the tests. The scribe line shall be cut in accordance with EN ISO 12944-6, clause A.1, into the previously wrapped specimen (but without cutting the galvanization layer of the hot-dip galvanized cylinders). The scribe line shall be placed centric and in the direction of the longitudinal axis through the corrosion protection system until the surface of the metal cylinders (substrate). The length of the scribe line shall be 50 ± 1 mm, the width 2 ± 0.2 mm. No special conditioning is needed.

At the end of the exposure period the condition of the corrosion protection system shall be visually assessed regarding blistering, rusting, cracking and flaking following EN ISO 12944-6, clause 6.3, table 4, rows 1 - 4, and regarding dislocation of the tapes.

After that, the corrosion protection system shall be removed and the corrosion at scribe shall be assessed on the bases of EN ISO 12944-6, clause 6.3, clause A.2 but only by measuring the corrosion penetration under the corrosion protection system at the two ends of scribe line on the longitudinal axis. The corrosion penetration at scribe ends M_L [mm] shall be calculated as follows:

$$M_L = (C_L - L)/2 \quad \text{Equation 2.2.1.1}$$

where C_L [mm] is the measured total length of corrosion at scribe on the longitudinal axis and L [mm] is the measured length of the scribe. The result of the calculation of the corrosion at scribe shall be given with a precision of 0,1 mm.

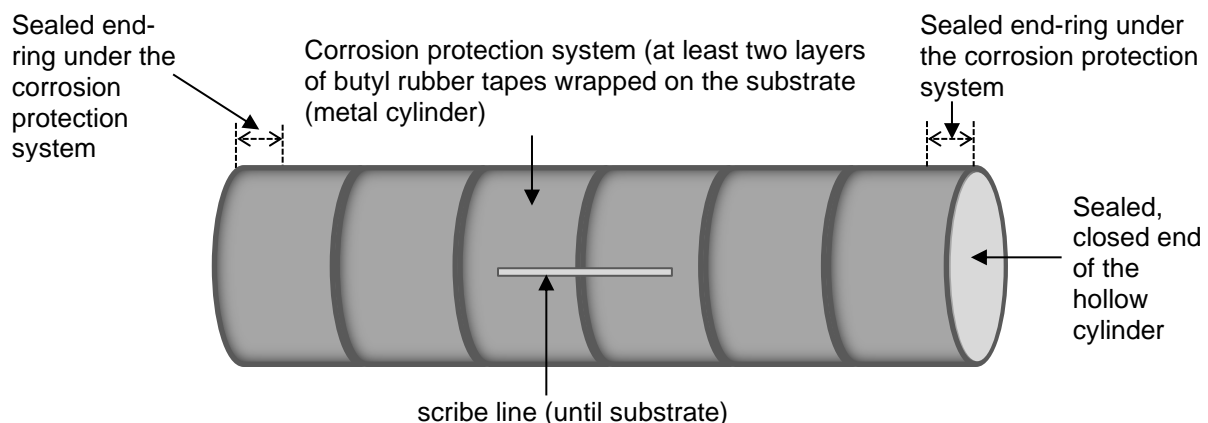


Figure 2.2.1.1: Example of the test specimen (with a centric scribe line)

⁴ Based on the nature of the corrosion protection system (wrapping tapes) it cannot be applied on panel-shaped substrates, so the cylindrical shape has been chosen as representative for both round or oval cross-section as per intended use.

Expression of results

In the ETA the applied exposure period in hours (i.e., 1440, 720 or 480 h) shall be indicated; in addition, either the information shall be given that no detectable as well as no visible defects under $\times 10$ magnification were observed, or the observations about the defects shall be described in the ETA. Where applicable, the description shall follow the standardised rating scheme for designating the quantity and size of defects of the relevant standards referred to in EN ISO 12944-6, clause 6.3 (i.e., EN ISO 4628-2 for blistering, EN ISO 4628-3 for rusting, EN ISO 4628-4 for cracking and EN ISO 4628-5 for flaking). The corrosion penetration at scribe ends in the direction of the longitudinal axis M_L [mm] (highest value of all specimens) shall additionally be stated in the ETA.

2.2.2 Resistance to water condensation

The test shall be conducted in accordance with EN ISO 6270-2, test regime CH, for a specific exposure period in hours (i.e., 720, 480, 240 or 120 h) according to EN ISO 12944-6, Table 1, column "water condensation", that corresponds with the durability range "high" of EN ISO 12944-1 and with the highest corrosivity category (atmospheric environment) of EN ISO 12944-2 covered by the intended use, see clause 1.2.1.

The test specimens shall be as described in clause 2.2.1 but without a scribe line, see figure 2.2.2.1. No special conditioning is needed.

At the end of the exposure period the condition of the corrosion protection system shall be visually assessed regarding blistering, rusting, cracking and flaking following EN ISO 12944-6, clause 6.3, table 4, rows 1 - 4, and regarding dislocation of the tapes.

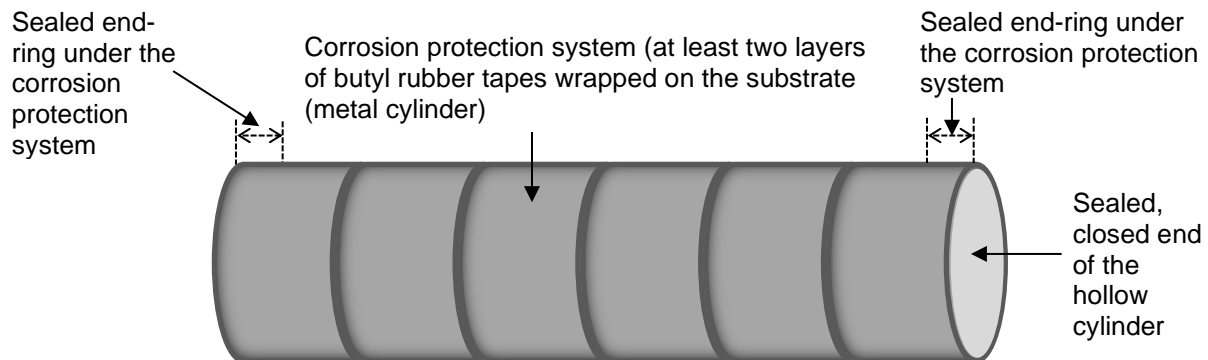


Figure 2.2.2.1: Example of the test specimen (without a scribe line)

Expression of results

In the ETA the applied exposure period in hours (i.e., 720, 480, 240 or 120 h) shall be indicated; in addition, either the information shall be given that no detectable as well as no visible defects under $\times 10$ magnification were observed, or the observations about the defects shall be described in the ETA. Where applicable, the description shall follow the standardised rating scheme for designating the quantity and size of defects of the relevant standards referred to in EN ISO 12944-6, clause 6.3 (i.e., EN ISO 4628-2 for blistering, EN ISO 4628-3 for rusting, EN ISO 4628-4 for cracking and EN ISO 4628-5 for flaking).

2.2.3 Resistance to humid atmospheres containing sulphur dioxide

Assessment method

The test shall be conducted in accordance with EN ISO 22479, method B (volume of used sulphur dioxide: one litre) for an exposure period in hours (30 cycles \times 24 hour = 720 h).

The test specimens shall be as described in clause 2.2.1 but without a scribe line, see figure 2.2.2.1. No special conditioning is needed.

At the end of the exposure period the condition of the corrosion protection system shall be visually assessed regarding blistering, rusting, cracking and flaking following EN ISO 12944-6, clause 6.3, table 4, rows 1 - 4, and regarding dislocation of the tapes.

Expression of results

In the ETA the exposure period in hours (i.e., 720 h) shall be indicated; in addition, either the information shall be given that no detectable as well as no visible defects under $\times 10$ magnification were observed, or the observations about the defects shall be described in the ETA. Where applicable, the description shall follow the standardised rating scheme for designating the quantity and size of defects of the relevant standards referred to in EN ISO 12944-6, clause 6.3 (i.e., EN ISO 4628-2 for blistering, EN ISO 4628-3 for rusting, EN ISO 4628-4 for cracking and EN ISO 4628-5 for flaking).

2.2.4 Resistance to artificial weathering by xenon radiation

Assessment method

The test shall be performed by radiation with xenon bulbs according to EN ISO 16474-2 to check the ageing of the butyl rubber wrapping during outdoor weathering. Hereby the method A and cycle number 1 using black-standard thermometer (BST) in accordance with table 3 of EN ISO 16474-2 shall be used.

The total exposure time shall be 2000 h.

The test specimens shall be three plain plates of about 150 mm x 50 mm, 2 mm thick and covered with the corrosion protection system.

At the end of the exposure period the condition of the corrosion protection system shall be visually assessed regarding blistering, cracking and flaking following EN ISO 12944-6, clause 6.3, table 4, rows 1, 3 and 4, and regarding dislocation of the tapes.

Additionally, the colorimetric observation according to EN ISO/CIE 11664-4 shall be executed by using the CIE standard illuminant D 65 and the measurement geometry "45/0.10 standard observer".

Expression of results

In the ETA the exposure period in hours (i.e., 2000 h) shall be indicated; in addition, either the information shall be given that no detectable as well as no visible defects under $\times 10$ magnification were observed, or the observations about the defects shall be described in the ETA. Where applicable, the description shall follow the standardised rating scheme for designating the quantity and size of defects of the relevant standards referred to in EN ISO 12944-6, clause 6.3 (i.e., EN ISO 4628-2 for blistering, EN ISO 4628-4 for cracking and EN ISO 4628-5 for flaking).

The highest measured colour difference ΔE^*_{ab} compared to not weathered specimens shall additionally be stated in the ETA.

2.2.5 Resistance to artificial weathering by UV radiation

Assessment method

The wrapping shall be exposed to artificial weathering in the UV-test equipment according to EN ISO 16474-3 with the following test parameters:

The test specimens shall be as described in clause 2.2.1 but without a scribe line, see figure 2.2.2.1.

A fluorescent UV lamps for daylight UV (method A) of type 1A (UVA-340) shall be used with irradiance of 0,83 W/m²/nm at 340 nm and with temperature control by black-panel sensor.

The total exposure time shall be 2000 h (i.e., 167 cycles x 12 h).

Each cycle shall be as follows:

- 0,5 h water spraying at 15 °C and UV-light,
- cooling down to -20 °C in 0,5 h,
- storing at -20 °C and 20 % humidity for 4 h,
- heating up to 55 °C in 1 h,
- 55 °C with UV-light and water spraying for 5,5 h,
- cooling down to 15 °C in 0,5 h and UV-light.

At the end of the exposure period the condition of the corrosion protection system shall be visually assessed regarding blistering, rusting, cracking und flaking following EN ISO 12944-6, clause 6.3, table 4, rows 1 - 4, and regarding dislocation of the tapes.

Expression of results

In the ETA the exposure period in hours (i.e., 2000 h) shall be indicated; in addition, either the information shall be given that no detectable as well as no visible defects under $\times 10$ magnification were observed, or the observations about the defects shall be described in the ETA. Where applicable, the description shall follow the standardised rating scheme for designating the quantity and size of defects of the relevant standards referred to in EN ISO 12944-6, clause 6.3 (i.e., EN ISO 4628-2 for blistering, EN ISO 4628-3 for rusting, EN ISO 4628-4 for cracking and EN ISO 4628-5 for flaking).

2.2.6 Resistance to water vapour transmission

Assessment method

The water vapour transmission of the corrosion protection system shall be assessed in accordance with ISO 2528 with the following test parameters/conditions:

A total of 5 test specimen of the corrosion protection system without substrates shall be tested.

The specimens shall be conditioned for at least 3 hours at (23 ± 2) °C and (50 ± 5) % relative humidity before testing.

In the test, it shall be exposed to a defined test climate of (23 ± 2) °C and 100 % relative humidity.

Expression of results

The water vapour transmission rate (WVTR) in $[g/(m^2 \times d)]$ shall be recorded. The highest value of all specimens shall be given in the ETA.

2.2.7 Reaction to fire

Assessment method

The corrosion protection system shall be tested, using the test method(s) relevant for the corresponding reaction to fire class according to EN 13501-1.

The following provisions shall apply for the relevant tests:

The necessary tests according to EN ISO 11925-2 shall be performed with edge exposure as well as with surface exposure on specimens as follows:

- a) complete assemblies of the kit consisting of base layer and top layer, glued onto a representative standard metal sheet according to EN 13238,
- b) without and with a visual joint (resulting from the overlapping of both layers) in the central axis of the specimens in length direction; at least two tests shall be performed with each of these joint configurations and with each of the flame exposure types; four further tests shall be carried out with the most critical specimen configuration with regard to the overlapping joint and the exposure type.

The necessary tests according to 13823 (SBI) shall be performed on specimens built-up with complete assemblies of the kit (consisting of base layer and top layer) which are glued onto a standard metal sheet according to EN 13238 as follows:

- a) at least one specimen with horizontal orientation of both base layer and top layer (including the prescribed overlapping of about 50% of each layer) with beginning of the gluing process at the bottom edge of the specimens; an additional overlapping of the layer (forming a vertical joint) shall be considered in a distance of 200 mm away from the inner corner of the specimens,
- b) at least one specimen with vertical orientation of both base layer and top layer (including the prescribed overlapping of about 50% of each layer) with beginning of the gluing process at the inner corner of the specimens; an additional overlapping of the layer (forming a horizontal joint) shall be considered in a distance of 500 mm above the bottom edge of the specimens.

At least one test shall be carried out using the SBI method according to EN 13823 with both specimen configurations "a)" and "b)". The tests shall be repeated at least twice with that configuration which delivered the more critical test results in the orientation tests to obtain the prescribed number of tests with the same specimen configuration needed for classification purposes.

The following product parameters shall be considered when preparing the test specimens and executing the tests:

- variations of a product family (as defined by a combination of certain raw materials and certain type of production process) of both base layer and top layer,
- possible combinations of variations of base layer and top layer,
- highest and lowest thickness of both layers, if relevant,
- highest and lowest weight per unit area of both layers, if relevant.

The results of tests considering the aforementioned parameters and conditions in fully are valid for:

- the intend use of the kit on load-bearing components made of those metals covered by the standard metal sheet according to EN 13823 used in the tests, without consideration of aging impacts as tested according to clauses 2.2.1 to 2.2.6,
- those variations of the defined product family of base layer and top layer used in
- the tested combinations of both layers only and with,
 - the tested layer thickness or the whole range between those layer thickness values tested,
 - the tested weight per unit area of the layers or the whole range between those weight per unit area values of the layers tested, as well as
 - the same or lower overlapping [in centimetre] of the layers.

Expression of results

The corrosion protection system shall be classified according to the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

The class achieved for the corrosion protection kit shall be stated in the ETA together with those conditions (see parameters addressed above) for which the classification is valid.

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 98/214/EC, as amended by Commission Decision 2001/596/EC.

The system is 2+.

In addition, with regard to reaction to fire for products covered by this EAD the applicable European legal act is Commission Decision 98/214/EC, as amended by Commission Decision 2001/596/EC.

The systems are 1 or 2+.

Note: Both AVCP level 1 and 2+ can be applicable depending on the footnotes concerning the reaction to fire in the mentioned 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	Identification of incoming material such as: a - Polymeric film/reinforcement: - Type - Thickness (ISO 4593) - Tensile properties (EN ISO 527-3) b - Adhesive (butyl rubber) - Type - Saponification value (EN 12068, annex L)	Examination of supplied documentation	According to control plan	According to control plan	Every batch
2	Shore hardness D	EN ISO 868	According to control plan	EN ISO 868	Every production unit
3	Thickness	ISO 4593	According to control plan	ISO 4593	Every batch
4	Elongation at brake	EN 12068, annex A	According to control plan	EN 12068, Annex A	Every batch
5	Tensile strength	EN 12068, annex A	According to control plan	EN 12068, Annex A	Every batch
6	Modulus at 10 % elongation	EN 12068, annex A	According to control plan	EN 12068, Annex A	Every batch
7	Peel strength - base layer to base layer	EN 12068, annex B	According to control plan	EN 12068, Annex B	Every batch
8	Peel strength - top layer to base layer	EN 12068, annex B	According to control plan	EN 12068, Annex B	Every batch
9	Peel strength to pipe surface	EN 12068, annex C	According to control plan	EN 12068, Annex C	Every batch
10	Reaction to fire	Indirect tests on the layers, e.g. - thickness, - weight per unit area	According to control plan	According to control plan	Every batch
		Direct tests, clause 2.2.7	According to control plan	According to control plan	Once per year*
* To be performed with a reduced number of tests on specimens randomly taken from the consecutive production process					

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body of the product in the procedure of assessment and verification of constancy of performance 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 ascertain that the factory production control with the staff and equipment are suitable to ensure a continuous and orderly manufacturing of the bonding material and metal parts. In particular, it shall be checked if all tasks in Table 3.2.1 were performed.	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	According to control plan	According to control plan	When starting the production or a new line
Continuous surveillance, assessment and evaluation of factory production control					
2	The Notified Body will ascertain that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan.	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	According to control plan	According to control plan	Once a year

The intervention of the notified body under AVCP system 1 is only necessary for reaction to fire for products 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 3.3.2.

Table 3.3.2 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 ascertain that the factory production control with the staff and equipment are suitable to ensure a continuous and orderly manufacturing related to reaction to fire, taking into account productions stages limiting of organic material and/or the addition of fire retardants.	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	According to control plan	According to control plan	When starting the production or a new line
Continuous surveillance, assessment and evaluation of factory production control					
2	The Notified Body will ascertain that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan related to reaction to fire, taking into account productions stages limiting of organic material and/or the addition of fire retardants.	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	According to control plan	According to control plan	Once a year

4 REFERENCE DOCUMENTS

EN ISO 527-3:2018	Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets (ISO 527-3:2018)
EN ISO 868:2003	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)
ISO 2528:2017	Sheet materials — Determination of water vapour transmission rate (WVTR) — Gravimetric (dish) method
ISO 4593:1993	Plastics — Film and sheeting — Determination of thickness by mechanical scanning
EN ISO 4628-2:2016	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 2: Assessment of degree of blistering (ISO 4628-2:2016)
EN ISO 4628-3:2016	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 3: Assessment of degree of rusting (ISO 4628-3:2016)
EN ISO 4628-4:2016	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking (ISO 4628-4:2016)
EN ISO 4628-5:2022	Paints and varnishes - Evaluation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 5: Assessment of degree of flaking (ISO 4628-5:2022)
EN ISO 6270-2:2018	Paints and varnishes - Determination of resistance to humidity - Part 2: Condensation (in cabinet exposure with heated water reservoir) (ISO 6270-2:2017)
EN ISO 9227:2022	Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2022)
EN ISO/CIE 11664-4:2019	Colorimetry – Part 4: CIE 1976 L*a*b colour space (ISO/CIE 11664-4:2019)
EN ISO 11925-2:2020	Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test (ISO 11925-2:2020)
EN 12068:1998	Cathodic protection - External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection - Tapes and shrinkable materials
EN ISO 12944-1:2017	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 1: General introduction (ISO 12944-1:2017)
EN ISO 12944-2:2017	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 2: Classification of environments (ISO 12944-2:2017)
EN ISO 12944-6:2018	Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 6: Laboratory performance test methods (ISO 12944-6:2018)
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 13823:2020+A1:2022	Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item
EN ISO 16474-2:2013 + A1:2022	Paints and varnishes - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps (ISO 16474-2:2013 + Amd.1:2022)
EN ISO 16474-3:2021	Paints and varnishes - Methods of exposure to laboratory light sources - Part 3: Fluorescent UV lamps (ISO 16474-3:2021)
EN ISO 22479:2022	Corrosion of metals and alloys - Sulfur dioxide test in a humid atmosphere (fixed gas method) (ISO 22479:2019)