



EUROPEAN ASSESSMENT DOCUMENT

EAD 040016-00-0404

February 2016

GLASS FIBRE MESH FOR REINFORCEMENT OF CEMENT BASED RENDERINGS

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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) No 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 applies to a glass fibre mesh for reinforcement of cement based renderings which is leno woven fabrics made of glass fibre strands. To provide resistance to alkali conditions, they are coated by an organic layer. The distance of strands is at least 3 mm so that the reinforced rendering or mortar sufficiently penetrates the meshes. The type of the glass fibre mesh shall be declared in the ETA (E-glass, C-glass, etc.) – see EN ISO 2078.

Note: Currently, it is assumed that the meshes assessed for cement based renderings are also suitable for use in polymeric renderings.

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 product is used as reinforcement of cement based renderings (mortars) with the thickness of 2-10 mm. The reinforcement shall be embedded in a fresh mortar and sufficiently covered. The reinforcement prevents the hardened mortar from cracking, caused especially by dilatation.

The glass fibre meshes are also used in base coats of façade systems with rendering.

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 glass fibre mesh for reinforcement of cement based renderings for the intended use of 25 years when installed in the works (provided that the glass fibre mesh for reinforcement of cement based renderings 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 works¹.

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

¹ 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.

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 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 1 shows how the performance of glass fibre mesh for reinforcement of cement based renderings is assessed in relation to the essential characteristics.

Table 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 (level, class, description)
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	see clause 2.2.1	Class according to EN 13501-1 (A1, A2, B, C, D,E, F)
2	Organic content	see clause 2.2.2	Level Organic content [%] Ash content [%]
3	Heat combustion	See clause 2.2.3	Level Q _{PSC} [MJ/kg]
Basic Works Requirement 4: Safety and accessibility in use			
4	Mesh size	see clause 2.2.4	Level warp direction [mm] weft direction[mm]
5	Roll width	see clause 2.2.5	Level [mm]
6	Weaving accuracy	see clause 2.2.6	Description

No	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)
7	Tensile strength and elongation	see clause 2.2.7	Level tensile strength in the as-delivered state β [N/mm] – declared value, elongation in the as-delivered state ε [%] tensile strength after alkalis conditioning β [N/mm] (shall be at least 20 N/mm and at least 50 % of the strength in the as-delivered state), elongation after alkalis conditioning ε [%]
8	Mass per unit area	see clause 2.2.8	Level [g/m ²]
9	Thickness	see clause 2.2.9	Level [mm]

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

2.2.1 Reaction to fire

The glass fibre mesh for reinforcement of cement based renderings shall be tested, using the test method(s) relevant for the corresponding reaction to fire class, in order to be classified according to EN 13501-1.

For the tests according to EN ISO 11925-2 and EN 13823 (if relevant), the product is tested in a frame as defined in CEN/TS 15447 and without any substrate. If there are more products with the same type of coating to be classified, the testing of the product with the highest mass per unit of the coating covers all the products.

The classification according to EN 13501-1 shall be performed or the product is classified as F - without testing.

2.2.2 Organic content

The ash content shall be determined at $(625 \pm 20)^\circ\text{C}$ on three square samples of size 100 mm x 100 mm, cut of parallel to the yarn and at least 100 mm apart from the side to constant mass (see ETAG 004 C.3.2). The result is expressed as a percentage relative to the initial mass.

The organic content is determined by subtracting percent ash content from one hundred.

Note: The ash content can be determined according to ISO 1887 in reasoned cases.

The ash content and the organic content of all three samples [%] are stated in the ETA.

Note: This characteristic is different from the percentage of coating (including inorganic particles) which can be also declared by the manufacturer.

2.2.3 Heat combustion

The test shall be performed according to EN ISO 1716.

Gross heat combustion Q_{PSC} [MJ/kg] according EN ISO 1716 is stated in the ETA.

2.2.4 Mesh size

The mesh size shall be determined by measuring the distance between 21 yarns – axial distance (i.e. 20 meshes) in both warp and in weft direction.

The average mesh size is determined by dividing the measured distance by the number of meshes (20). The mesh opening is calculated by subtracting the thickness of the yarn from the mesh size.

All the measurements shall conform to a value declared by a manufacturer. Manufacturer declares in his technical documentation a minimum value of the mesh opening 3 mm (see also clause 1.1 of this EAD). The average mesh size and the mesh opening [mm] in warp and in weft direction is stated in the ETA.

2.2.5 Roll width

The width of the roll shall be measured by a suitable device with the minimum accuracy of ± 1 mm. The measurement shall be performed at least 3 times on a sample. The measurements shall be done at the minimum distance of 5 metres.

The average value of the roll width [mm] is stated in the ETA.

2.2.6 Weaving accuracy

At least 10 metres of the mesh shall be visually inspected. All singularities and defects of the mesh shall be recorded.

The product does not pass this test when any of the following observations have been made:

- an untrimmed edge in any length
- deflected (uneven) fronts of rolls over ± 5 mm (measured from the edge of the inner tube)
- a gap over treble distance of wefts or warps in any length
- weft skewing or weft waving over 4 % of width of the fabric (measured by a rectangular rule)
- a cracked yarn

Description of weaving accuracy after visual inspection is stated in the ETA.

2.2.7 Tensile strength and elongation

The test shall be performed in as-delivered state and after alkali conditioning according to ETAG 004, clause 5.6.7.1.

The average value of the tensile strength in the as-delivered state [N/mm] and the average value of the elongation in the as-delivered state ε [%] is stated in the ETA.

The average value of the tensile strength after alkalis conditioning and the average value of the elongation after alkalis conditioning ε [%] is stated in the ETA. Based on requirements of ETAG 004, Cl. 6.6.7.1, the average value of the tensile strength after alkalis conditioning shall be at least 20 N/mm and at least 50 % of the strength in the as-delivered state (residual strength).

2.2.8 Mass per unit area

The mass per unit area is determined by measuring and weighing a one metre length of the mesh. For reinforcement in roll form, the width of the sample should be the same as the roll width. The result is expressed in g/m^2 as the average value from 3 measurements.

The average value of the mass per unit area [g/m^2] is stated in the ETA.

2.2.9 Thickness

The thickness of the product (perpendicular distance between surfaces of the fabric) is determined by measuring according ISO 4603/Amd.1, Table 1, for the set of conditions 2- standard pressure 2,0 kPa and measuring-foot area 25 cm². The samples before test shall be conditioned in standard conditions according to ISO 187, Art. 5. Applied conditions shall be stated in the ETA.

The average value of the thickness [mm] is 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: Decision 1997/556/EC².

The system to be applied is: **2+**

In addition, with regard to reaction to fire for products covered by this EAD the applicable European legal act is: Decision 2001/596/EC³.

The systems to be applied are: **1, 2+**

² Official Journal of the European Communities/Union L 229 of 20.08.1997, p. 14.

³ Official Journal of the European Communities/Union L 209 of 2.8.2001, p. 33.

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 2.

Table 2 Control plan for the manufacturer; corner stones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC)					
1	Mesh size	see clause 2.2.4	declared value within the declared tolerance	measurement at least 3 times on a sample	every 100 000 metres
2	Roll width	see clause 2.2.5	declared value within the tolerance of 1 %	measurement at least 3 times on a sample	every 100 000 metres
3	Weaving accuracy	see clause 2.2.6	pass/fail	1 (at least 10 metres)	every 100 000 metres
4	Organic content	see clause 2.2.2	declared value within the tolerance of 4 %	3	every 100 000 metres
5	Heat combustion	see clause 2.2.3	declared value or lower	according to EN ISO 1716	when starting the production of the particular type of glass fibre mesh and following changes
6	Tensile strength and elongation	see clause 2.2.7	tensile strength in the as-delivered state – declared value; tensile strength after alkalis conditioning shall be at least 20 N/mm and at least 50 % of the strength in the as-delivered state	at least 10 samples in weft direction and at least 10 samples in warp direction	4x per year
7	Mass per unit area	see clause 2.2.8	declared value within the tolerance of 5%	1	every 100 000 metres
8	Thickness	see clause 2.2.9	declared value within the declared tolerance	3	every 100 000 metres

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance for glass fibre mesh for reinforcement of cement based renderings are laid down in Table 3.

Table 3 Control plan for the notified body; corner stones

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 shall verify the ability of the manufacturer for a continuous and orderly manufacturing of the product according to the European Technical Assessment. In particular the following items shall be appropriately considered <ul style="list-style-type: none"> – personnel and equipment – the suitability of the factory production control established by the manufacturer – full implementation of the prescribed test plan 				1/year
2	Reaction to fire *)	Presence of suitable test equipment			1/year
		Presence of trained personnel			1/year
		Presence of an appropriate quality assurance system and the necessary stipulations			1/year
Continuous surveillance, assessment and evaluation of factory production control					
3	It shall be verified that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan.				1/year
4	Reaction to fire *)	Presence of suitable test equipment			1/year
		Presence of trained personnel			1/year
		Presence of an appropriate quality assurance system and the necessary stipulations			1/year

*) System 1 for products of classes A1, A2, B or C, otherwise system 2+

4 REFERENCE DOCUMENTS

As far as no edition date is given in the list of standards thereafter, the standard in its current version at the time of issuing the European Technical Assessment, is of relevance.

- EN 13501-1 Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests
- EN 13823 Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item
- EN ISO 1716 Reaction to fire tests for products - Determination of the cross heat of combustion (calorific value)
- EN ISO 2078 Textile glass - Yarns - Designation
- EN ISO 11925-2 Reaction to fire tests - Ignitability of building products subjected to direct impingement of flame - Part 2: Single-flame source test
- ISO187 Paper, board and pulps. Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples
- ISO 1887 Textile glass - Determination of combustible-matter content
- ISO 4603 Textile glass - Woven fabrics -Determination of thickness
- CEN/TS 15447 Mounting and fixing in reaction to fire tests under the Construction Products Directive
- ETAG 004 External Thermal Insulation Composite Systems (ETICS) with Rendering, used as EAD