BRITISH STANDARD

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Precast concrete products — Specification of glassfibres for reinforcement of mortars and concretes

ICS 91.100.30

BSI
British Standards

National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/524, Precast concrete products.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Precast concrete products - Specification of glassfibres for reinforcement of mortars and concretes

Produits préfabriqués en béton - Spécification des fibres de verre destinées au renforcement des mortiers et des bétons

Betonfertigteile - Festlegung für Glasfasern als Bewehrung in Mörtel und Beton

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Foreword

This document (EN 15422:2008) has been prepared by Technical Committee CEN/TC 229 “Precast concrete products”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

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1 Scope

This European standard specifies requirements for glass fibres used as reinforcement in mortars and concrete for non-structural products. It applies to continuous filament glass fibre products in the form of roving, strands, or chopped strands and related products such as nets or mats based on these products.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14649, *Precast concrete products — Test method for strength retention of glass fibres in cement and concrete (SIC TEST)*

EN ISO 1889, *Reinforcement yarns — Determination of linear density (ISO 1889:1997)*

ISO 1887, *Textile glass — Determination of combustible-matter content*

ISO 1888, *Textile glass — Staple fibres or filaments — Determination of average diameter*

ISO 3341, *Textile glass yarns — Determination of breaking force and breaking elongation*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
Alkali Resistant (AR) glassfibre
glassfibre product resistant to the alkaline environment of matrices made from hydraulic cement Glassfibre manufactured and sold for the reinforcement of mortars and concrete products. The resistance is due particularly to the specific composition of the glass

NOTE See EN 1169.

3.2
filament
single glassfibre as drawn

(adapted from EN ISO 472)

3.3
strand
number of approximately parallel filaments of 8 microns to 30 microns individual filament diameter, held together with a size

(adapted from EN ISO 472)

3.4
cake
number of strands wound together on a former; an intermediate stage in the manufacturing process, prior to the conversion to "roving" or "mats"

(adapted from EN ISO 472)

3.5
roving
number of parallel strands wound together on a mandrel to form an uniform cylindrical package size

(adapted from EN ISO 472)

3.6
chopped strands
number of filaments bonded together with size to form strands in cake form, and then chopped into discrete lengths generally between 3 mm and 50 mm by the glassfibre manufacturer

(adapted from EN ISO 472)

3.7
size
coating materials applied to the strand during manufacture to facilitate or improve processing, use and performance of the glassfibre

(adapted from EN ISO 472)

3.8
binder
coating material applied during the fabrication of a glassfibre mesh or net to assist in the stability and processing characteristics of the mesh

3.9
tex
mass in grams per kilometre length of roving or strand

3.10
GRC
glass fibre reinforced cement (or concrete); a composite material consisting of a matrix of hydraulic binder reinforced with glassfibre, these materials being compatible

3.11
matrix
composition of the glassfibre reinforced cement without the fibres. It is made up of the mixture of sand, cement, water and any additives and admixtures

3.12
category
A: strength retention by strand (SIC) test $\geq$ 250 MPa (for example water dispersible fibres used in precast concrete)

B: strength retention by strand (SIC) test $\geq$ 350 MPa (for example integral fibres used in GRC)

4 Physical condition and properties

The product shall be contained in packaging materials in such a manner to give adequate protection in transport and storage.

The package shall be clearly labelled and indicate manufacturer, product code, and batch number or manufacturing code. At the manufacturer's discretion, additional information may be given according to ISO recommendations including filament diameter, roving or strand tex, strand length for chopped strands, and the end count (number of strands in the roving) for roving products.

The roving, stands or chopped strands shall be free from oil, grease, and other contaminants. A roving package shall be free from obvious damage and should not be deformed.

The properties of the roving or chopped strands shall comply with the requirements in Table 1 below.

5 Testing

The majority of the required tests are of a specialized nature and will be carried out by the glass fibre manufacturers or their agency. Traceability between the product delivered and manufacturing records must be ensured.

The strength retention of AR glassfibre shall be measured according to EN 14649.

Users of AR glassfibre should require that manufacturers of AR glassfibre can show independent validation of the performance in the SIC test.

6 Compliance

The glassfibre roving or chopped strands shall be deemed to comply with the requirements of this standard provided that the conditions of clause 4 are fulfilled and the results obtained on test samples comply with the requirements of Table 1.

Table 1 —Requirements

Property	Specification value	Method of test
Zirconia (ZrO_2) content	16 % minimum	X-ray fluorescence
Density	2,68 ± 0,3 g/cm^3	EN 14649
Tensile strength	1000 MPa to 1700 MPa	ISO 3341
Filament diameter	8 to 30 microns	ISO 1888
Roving tex	± 10 % from nominal	EN ISO 1889
Cut length	± 3 mm from nominal	
End count	± 20 % from nominal	Physical count
Loss on ignition (combustible matter)	± 20 % of the nominal value or ± 0,3 % whichever is the grater, subject to an upper limit of 3 % by weight	ISO 1887
Strength retention	• Category A ≥ 250 MPa • Category B ≥ 350 MPa The declared value shall be the characteristic (5 % fractile) strength retention	EN 14649

Bibliography

[1] EN ISO 472, Plastics — Vocabulary (ISO 472:1999)

[2] EN 197-1, Cement — Part 1: Composition, specifications and conformity criteria for common cements

[3] EN 197-2, Cement — Part 2: Conformity evaluation

[4] EN ISO 3344, Reinforcement products — Determination of moisture content (ISO 3344:1997)

[5] EN 1169, Precast concrete products — General rules for factory production control of glass-fibre reinforced cement

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