INTERNATIONAL STANDARD ISO 2559

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Textile glass mats (made from chopped or continuous strands) for reinforcement of plastics — Basis for a specification

Mats de verre textile (constitués de fils de base, coupés ou non) pour renforcement des matières plastiques — Base de spécification

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2559 was drawn up by Technical Committee ISO/TC 61, *Plastics*, and circulated to the Member Bodies in September 1971.

It has been approved by the Member Bodies of the following countries:

Australia	India	Spain
Austria	Israel	Sweden
Belgium	Italy	Switzerland
Brazil	Japan	Thailand
Canada	Netherlands	Turkey
Czechoslovakia	New Zealand	United Kingdom
Egypt, Arab Rep. of	Poland	U.S.A.
France	Portugal	U.S.S.R.
Germany	Romania	
Hungary	South Africa, Rep. of	

No Member Body expressed disapproval of the document.

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Textile glass mats (made from chopped or continuous strands) for reinforcement of plastics — Basis for a specification

1 SCOPE AND FIELD OF APPLICATION

This International Standard gives a basis for a specification applicable only to textile glass mats which are made from chopped or continuous strands and used for the reinforcement of plastics.

It is not applicable to mats made from filaments (surfacing mats), staple fibres and glass mat (or bats) of the type used for thermal and acoustic insulation.

2 REFERENCES

ISO 137, *Wool — Determination of fibre diameter — Projection microscope method.*[1]

ISO/R 291, *Plastics — Standard atmospheres for conditioning and testing.*

ISO/R 472/Add. 2, *Plastics — Definitions of terms.*

ISO 1144, *Textiles — Universal system for designating linear density (Tex system).*

ISO/R 1887, *Textile glass — Determination of the percentage of combustible matter of textile glass products.*

ISO/R 1888, *Textile glass — Determination of the average diameter of staple fibres or continuous filaments constituting a textile glass yarn — Cross-section method.*

ISO 2558, *Textile glass chopped-strand mats — Determination of time of dissolution of the binder in styrene.*

ISO 3374, *Textile glass mats — Determination of mass per unit area or "substance".*[2]

ISO 3598, *Textile glass yarns — Basis for a specification.*[2]

3 TECHNOLOGICAL DESCRIPTION

A complete and accurate technological description of a textile glass mat shall be given in the manufacturer's catalogue. It shall include those properties which are mandatory (a) and may include some, or all, of the optional properties (b) as indicated in each of the subsequent paragraphs.

3.1 Type of mat

The following data are characteristics of specific types of mat. They may be found for each type of mat, in the manufacturer's catalogue.

3.1.1 Whether strands are chopped or continuous. (a)

3.1.2 In the case of chopped strands, whether the mat consists of strands of similar or dissimilar nominal lengths. (a)

3.1.3 The code number of the plastic (or coupling) size deposited on the strand. (b)

3.1.4 Whether the bond holding the strands together in the mat is mechanical or chemical.

3.1.4.1 If the bond is chemical, give the following particulars :

— the type of binder ("liquid", "solid" or "liquid plus solid"); (a)

— the degree of solubility of the mat binder in styrene or other monomers (high, medium or low); (a)

— the percentage of combustible matter; (a)

— the code number of the binder(s). (b)

1) At present at the stage of draft. (Revision of ISO/R 137.)

2) At present at the stage of draft.

3.1.4.2 In the case of a needled mat, state whether or not it has a carrier. If it has, state its nature. (a)

3.2 Simplified designation of strands (a)

The simplified designation comprises in the following order :

1) a first capital letter[1], standing for the type of glass used by the producer;

2) a second capital letter, indicating the type of fibre used : C (continuous) for continuous filament;

3) a number equal to the nominal diameter of the filament, expressed in micrometres;

4) linear density of the strands (Tex system).

3.3 Mass of mat per unit area, in grams per square metre (a)

3.4 Width of mat, in centimetres (a)

3.5 Compatibility with resins (a)

Indicate the resins with which the mat is compatible (polyester, epoxy, etc.).

3.6 Technical process for which the product is suited (a)

(For example : hand lay up, hot press moulding, etc.).

3.7 Recommended field of application (b)

(For example : manufacture of boats, corrugated sheet, etc.).

4 LABELLING CODE

The labelling code includes :

1) A specific code name of the mat manufacturer. With this code name, the user can find in the manufacturer's catalogue the complete technical description of the type of mat as indicated in clause 3.

2) A dash.

3) Simplified designation of the strands (see 3.2).

4) A double space.

5) Mass per unit area of mat, in grams per square metre.

6) A dash.

7) Width of mat in centimetres.

For example :

M.XY9 – EC10 40 450 – 125

in which

M.XY9 is the code name of the type of mat, chosen by the manufacturer;

EC10 40 is the designation of strands;

450 is the mass per unit area in grams per square metre;

125 is the width in centimetres.

5 TECHNICAL REQUIREMENTS

5.1 General

Depending on their type, or the end use to which they are to be put, the textile glass mats shall satisfy some or all of the following technical requirements.

5.2 Strands used for the manufacture of mat

5.2.1 *Type of glass*

At the purchaser's request, the textile glass producer shall state the mean proportion of the essential chemical elements of the glass type supplied.

5.2.2 *Determination of the average diameter of filament constituting the strands*

Following ISO/R 1888 or by a longitudinal method.[2]

5.2.3 *Plastic size (or coupling size)*

For the manufacture of textile glass mats used in the reinforcement of resins, only such strands shall be used that have a plastic size compatible with the resin.

For each plastic size, the manufacturer shall indicate in his catalogue, all the types of resins with which the size is compatible.

5.3 Degree of solubility of a chopped-strand mat binder in styrene

The degree of solubility of the mat binder in styrene shall be determined according to ISO 2558.

1) It is usual to classify the glasses into the following types :
   – of high electrical resistance, for example : E glass;
   – of high alkali content, for example : A glass;
   – of good chemical resistance, for example : C glass;
   – of high mechanical strength, for example : S & R glasses.

2) In this case ISO 137 can be used.

The degree of solubility is represented by the time, expressed in seconds, taken by a mat specimen to break when immersed in styrene and under a predetermined tension.

It is usual to classify mats in three categories, according to the degree of solubility of the binder in pure styrene :

1) between 0 and 40 s : mats with high solubility;

2) between 40 and 200 s : mats with medium solubility;

3) greater than 200 s : mats with a low solubility.

5.4 Wettability of a mat

Method under study.

5.5 Tensile strength of a mat (for chopped strand mat)

Method under study.

5.6 Percentage of combustible matter

The manufacturer must indicate the percentage of combustible matter included in the glass mat, i.e. a percentage corresponding to the sum of

- the plastic size applied to the strands;
- the binder(s) used to bond the strands.

The percentage of combustible matter is determined by subjecting the sample to heat as described in ISO/R 1887.

For each type of mat, the manufacturer shall give the nominal value of the percentage of combustible matter in the mat. The difference between each individual value and the nominal value shall not be more than 50 % of the nominal value.

5.7 Mass per unit area

The mass per unit area of textile glass mat includes textile glass strands, plastic size and binder(s). It is expressed in grams per square metre.

The most usual nominal values are :

300, 400, 450 and 600 g/m^2

This property shall be measured according to ISO 3374.

For each type of mat, the manufacturer shall give the nominal value of the mass per unit area.

Individual measurements of the mass per unit area shall not differ by more than 35 % from the nominal value.

The average of all determinations of the mass per unit area on one mat shall not differ by more than 25 % from the nominal value.

5.8 Width

The width of the mat is the width of a mat trimmed on both edges. It is given in centimetres.

The difference between any individual width measurement and the nominal width must not be greater than 0,5 cm.

In the case of a mat untrimmed on one or both edges, give the minimum value of width of the corresponding trimmed mat. This width shall be measured to a point where the thickness of the mat has not visibly varied.

5.9 Length

The nominal roll length of the mat shall be agreed between supplier and purchaser.

35 % of the rolls of any delivery can have lengths shorter than the nominal length, it being understood that none of the rolls shall have a length of less than 10 m.

5.10 Thickness and recovery after compression

Methods under study.

6 DEFECTS

The appearance of the mat shall be uniform. In addition, the mat shall be free from the following defects :

- tears;
- holes;
- dirty marks;
- grease spots;
- foreign matter;
- clumps of strands.

7 SAMPLING AND CONDITIONING

7.1 Sampling

In the case of shipment or delivery inspection, a consignment will consist of the total number N of textile glass mat packages, of a given type and quality, delivered to one customer with one single dispatch note.

In each consignment, select at random n rolls as follows :

Number of rolls in consignment N	Number of rolls to be selected at random, and tested n
3 or less	1
4 to 10	2
11 to 30	3
31 to 75	4
76 or more	5

Unroll the five outer layers of all the rolls selected and then take, over the whole width, specimens appropriate to the tests to be performed.

Specimens shall not be folded.

7.2 Conditioning

7.2.1 *Pre-conditioning of test specimens*

If no specific conditioning is required, leave specimens for at least 6 h in one of the standard atmospheres specified in ISO/R 291.

7.2.2 *Test atmosphere*

Use one of the standard atmospheres specified in ISO/R 291.

8 PRESENTATION, PACKAGING, STORAGE CONDITIONS

Requirements concerning presentation, packaging, and storage conditions shall be given here.