INTERNATIONAL STANDARD

ISO 2559

Third edition
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Textile glass — Mats (made from chopped or continuous strands) — Basis for a specification

Verre textile — Mats (constitués de fils de base, coupés ou non) — Base de spécification

Reference number
ISO 2559:1991(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 2559 was prepared by Technical Committee ISO/TC 61, *Plastics*.

This third edition cancels and replaces the second edition (ISO 2559:1980), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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Introduction

A basis for a specification is intended to serve as a guide for the establishment of technical specifications for products of a given type. It should enumerate as completely as possible the points that should be considered at the time of writing of the specifications that will apply to a particular product or family of products whose characteristics are closely related. These specifications may be established by a producer, a supplier, a user or a standards organization.

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Textile glass — Mats (made from chopped or continuous strands) — Basis for a specification

1 Scope

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

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

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 139:1973, *Textiles — Standard atmospheres for conditioning and testing.*

ISO 291:1977, *Plastics — Standard atmospheres for conditioning and testing.*

ISO 472:1988, *Plastics — Vocabulary.*

ISO 1144:1973, *Textiles — Universal system for designating linear density (Tex System).*

ISO 1886:1990, *Reinforcement fibres — Sampling plans applicable to received batches.*

ISO 1887:1980, *Textile glass — Determination of combustible matter content.*

ISO 1888:1979, *Textile glass — Determination of the average diameter of staple fibres or continuous filaments constituting a textile glass yarn — Cross-section method.*

ISO 2078:1985, *Textile glass — Yarns — Designation.*

ISO 2558:1974, *Textile glass chopped-strand mats for reinforcement of plastics — Determination of time of dissolution of the binder in styrene.*

ISO 3342:1987, *Textile glass — Mats — Determination of tensile breaking force.*

ISO 3374:1990, *Textile glass mats — Determination of mass per unit area.*

ISO 3616:1977, *Textile glass — Mats — Determination of average thickness, thickness under load and recovery after compression.*

3 Technical description

A complete and accurate technical description of a textile glass mat (see ISO 472) shall be given in the manufacturer's catalogue. It shall include those properties that are mandatory, as indicated by (m), and may include some or all of the optional properties, indicated by (o), as listed in this clause.

3.1 Type of mat

3.1.1 Whether the strands are chopped or not (m).

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

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

3.1.4 Whether the strands are bound together mechanically or chemically (m).

3.1.4.1 If a chemical binder is used:

— whether the binder is solid or liquid-based (m);

— the degree of solubility of the binder in styrene or other monomers (high, medium or low — see 5.3) (m);

— the percentage of combustible matter (m);

— the code number of each binder (o).

3.1.4.2 In the case of mechanical binding (needled mat):

— whether the mat has a carrier or not (m);

— if it has, the nature of the carrier (m).

3.2 Designation of strands (see ISO 2078)

3.2.1 One or more initial capital letters indicating the type of glass used in the production (m).

3.2.2 A capital letter indicating the strand type: C for continuous, D for discontinuous (m).

3.2.3 The linear density (tex) (see ISO 1144) of the basic strand(s) in the mat (o).

3.3 Mass per unit area of mat

The mass per unit area of the mat, in grams per square metre (m).

3.4 Width of mat

The width of the mat, in centimetres (m).

The specification of the width of the mat shall also include whether one or both edges are trimmed or untrimmed (m).

4 Labelling code

The labelling code shall comprise the following elements:

a) an identification code specific to the manufacturer and the type of mat (with this information, the user can find in the manufacturer's catalogue the technical description of the type of mat as indicated in clause 3);

b) a double space;

c) the mass per unit area of the mat, in grams per square metre;

d) a hyphen;

e) the width of the mat, in centimetres.

For example:

M.XY9 450-125

where

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

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

125 is the width, in centimetres.

5 Technical requirements

The specification shall define, for each particular type of mat, the appropriate characteristics (physical, mechanical, visual and/or resin compatibility) including tolerances where appropriate.

For each of the characteristics used in the specification, the criteria for acceptance or rejection of a lot shall be stated.

5.1 General

Depending on the type of mat and the intended end use, textile glass mats shall satisfy some or all of the following technical requirements.

5.2 Strands used in the manufacture of the mat

5.2.1 Type of glass

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

5.2.2 Average diameter of the filaments constituting the strand

The average diameter of the filaments constituting the strands shall be determined in accordance with ISO 1888[1].

5.2.3 Plastic size (coupling size)

For the manufacture of textile glass mats used in the reinforcement of plastics, only those strands shall be used that have plastic size.

1) ISO 1888:1979 is currently being revised. The new edition will also include the longitudinal-section method.

The manufacturer shall indicate in his catalogue all the resin types 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 in accordance with ISO 2558.

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

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

less than 60 s: binders with high solubility;

between 60 s and 200 s: binders with medium solubility;

greater than 200 s: binders with low solubility.

5.4 Tensile strength

The tensile strength shall be determined in accordance with ISO 3342.

5.5 Percentage of combustible matter

The manufacturer shall indicate the percentage by mass of combustible matter 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 bind the strands.

The percentage of combustible matter shall be determined by subjecting the specimen to heat as specified in ISO 1887.

For each type of mat, the manufacturer shall give the nominal value of the percentage of combustible matter in the mat.

5.6 Mass per unit area

The mass per unit area of the textile glass mat includes the textile glass strands, plastic size and binder(s). The most common nominal values are 300 g/m^2, 375 g/m^2, 450 g/m^2 and 600 g/m^2.

This property shall be determined in accordance with ISO 3374.

For each type of mat, the manufacturer shall give the nominal value of the mass per unit area, expressed in grams per square metre.

5.7 Width

The width of the mat is the width of the mat trimmed along both edges. It shall be expressed in centimetres.

In the case of a mat untrimmed along one or both edges, the nominal value of the width of the corresponding trimmed mat shall be given. This width shall be measured between two points where the thickness of the mat does not visibly vary. In the event of dispute between the interested parties, the method described in annex A may be used. The tolerance on the width of an untrimmed mat shall be agreed between the interested parties.

5.8 Length

The roll length of the mat shall be fixed by prior agreement between the interested parties.

5.9 Mean thickness

The mean thickness shall be determined in accordance with ISO 3616.

6 Visual non-conformities

The mat shall be uniform in appearance. The roll shall be wound with appropriate compaction and the edges aligned such that telescoping does not exceed a given tolerance.

Listed below are a number of recognised visible non-conformities, produced during manufacture or during subsequent handling, which may exist in a mat:

— tears;

— holes;

— dirty marks;

— grease spots;

— foreign matter;

— clumps of strands;

— clumps or strips of binder;

— dark strands;

— poorly bonded surfaces;

— locally thin areas;

— locally poorly bonded areas;

— irregular edges.

The permissible number and degree of these non-conformities shall be agreed between the interested parties.

7 Sampling and conditioning

7.1 Sampling

Sampling shall be carried out as specified in ISO 1886.

Unroll the five outer layers of all the rolls selected and then take, over the whole width, specimens appropriate to the test 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 291 or ISO 139.

7.2.2 Test atmosphere

Use the standard atmosphere chosen in 7.2.1.

8 Presentation, packaging and storage conditions

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

Annex A
(informative)

Determination of the width of an untrimmed mat

The method described below may be used in the case of dispute between the interested parties.

A.1 Mats untrimmed along one edge

Cut, from across the whole width of the mat, a 30 cm strip. From this strip, cut a rectangular specimen of 50 cm $\pm$ 5 cm, containing the untrimmed edge (see figure A.1).

Place the specimen between two vertical guides approximately 10 mm apart, with the untrimmed edge lowermost. Measure the vertical height h (see figure A.2), which corresponds to the width of the specimen.

Measure directly (as in the case of a mat trimmed along two edges — see clause A.2) the width b of the remaining portion of the strip.

The width of the sample of mat is $h + b$.

A.2 Mats untrimmed along two edges

Proceed as in clause A.1, but cut from each edge of the strip of mat a specimen of 50 cm $\pm$ 5 cm having an untrimmed edge.

Measure the vertical height h_1 and h_2 of each of these specimens.

The width of the sample of mat is $h_1 + h_2 + b$.

Dimensions in centimetres

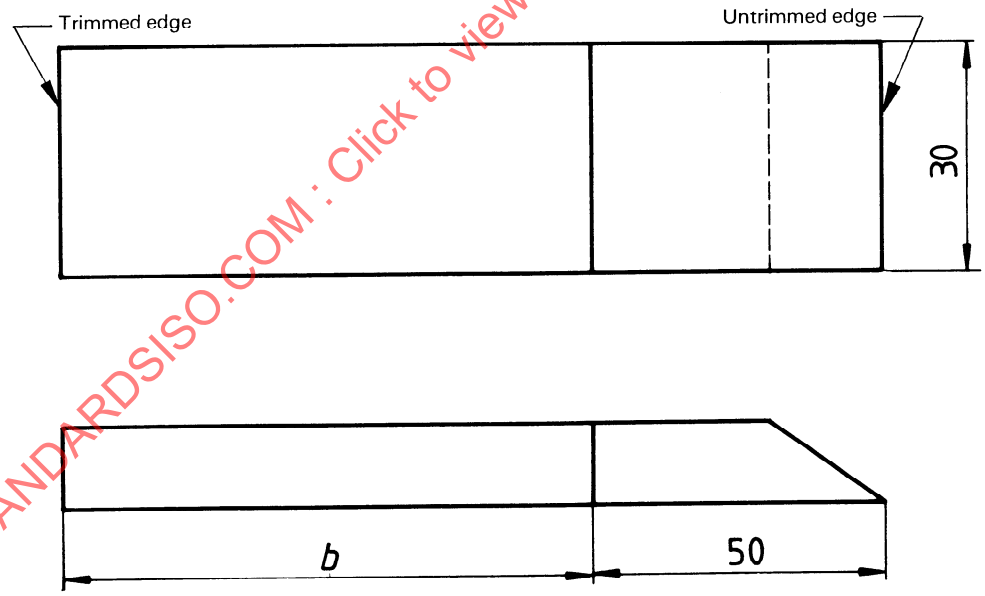

Figure A.1