INTERNATIONAL STANDARD 2797

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Textile glass — Rovings — Basis for specification

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

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 2797 was drawn up by Technical Committee ISO/TC 61, *Plastics*, and circulated to the Member Bodies in July 1972.

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

Austria	Iran	Romania
Belgium	Israel	Spain
Brazil	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Poland	U.S.S.R.
Hungary	Portugal	

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

South Africa, Rep. of
U.S.A.

Printed in Switzerland

Textile glass — Rovings — Basis for specification

1 SCOPE AND FIELD OF APPLICATION

This International Standard lays down the basis for specification of textile glass rovings.

2 REFERENCES

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

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

ISO 178, *Plastics — Determination of flexural properties of rigid plastics.*

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

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

ISO 1144, *Textiles — Universal system for the designation of linear density (Tex system).*

ISO/R 1886, *Textile glass — Procedure for sampling batches or consignments of textile glass continuous filament yarn, staple fibre yarn and roving packages.*

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-sectional method.*

ISO/R 1889, *Textile glass — Determination of linear density of textile glass continuous filament yarns, staple fibre yarns and rovings in the form of packages.*

ISO 2078, *Textile glass yarns — Designation.*

3 GENERAL

Textile glass fibre rovings can be divided into two main groups :

— rovings which are chopped during subsequent processing (for example, spray-up rovings, preform rovings, rovings for continuous laminating, sheet moulding compounds, and injection moulding of thermosets);

— rovings which are processed without being chopped (for example, rovings for filament winding, weaving, or pultrusion).

Each technique has its own requirements as far as roving processing characteristics are concerned. It is therefore recommended that the intended use be mentioned when ordering.

In addition to their division into two main groups, according to the above-mentioned processing techniques, rovings differ by :

— linear density (in tex) of the roving and also the linear density (in tex) of the strands and the number of the strands;

— the packaging of the rovings, which can be supplied with or without carrier tubes.

The rovings wound onto tubes can be unwound only from the outside.

4 DESIGNATION

The designation of the rovings shall be in accordance with ISO 2078, which implies mention of the total linear density of the roving, expressed in tex.

For some purposes, in addition, the linear density of the strands and their number may be given.

5 TERMS AND DEFINITIONS

Any term which is not described by definition in any of the relevant documents mentioned in clause 2 shall be included in this clause of the specification.

6 PROPERTIES AND TEST METHODS

6.1 Rules for sampling

Sampling shall be carried out in accordance with the provisions of ISO/R 1886.

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

6.2 General requirements

The rovings shall be clean (i.e. free from oil, grease and other contamination). They shall not be streaked, shall be free from obvious defects and shall be uniform[1] in colour; they shall have a firm and regular build with ends reasonably square to allow trouble-free unwinding.

They shall be free from loops except in the case of split filament for which some looping cannot always be avoided.

6.3 Conditioning

The packing shall be removed. If no specific conditioning is required, specimens shall be kept for at least 6 h in a standard atmosphere of temperature 23 ± 2 °C and relative humidity 50 ± 5 %, or in one of the other atmospheres specified in ISO/R 291 and ISO 139.

6.4 Specific properties

6.4.1 *Type of glass*

At the purchaser's request the glass may be defined (in a generally acceptable manner) by chemical, physical or other relevant properties.

The glass composition shall be determined according to appropriate national standards.

6.4.2 *Filament diameter*

The nominal filament diameter must be specified. The average value for the actual filament diameter can be determined by the cross-section method given in ISO/R 1888 or by the longitudinal method given in ISO 137.

6.4.3 *Linear density*

The linear density is expressed in tex, i.e. the mass in grams of 1 km of roving.

The linear density shall be determined according to ISO/R 1889.

The tolerances are given in three classes with reference to the nominal value, as shown in table 1.

TABLE 1

Class	Tolerance on individual measurement	Tolerance on the mean value of six measurements taken on six different packages (one measurement per package)
1	± 15 %	± 7 %
2	± 10 %	± 5 %
3	± 7 %	± 3 %

The product literature shall indicate the class of tolerance for each roving, with regard to the intended end use.

Purchasers shall state the class of tolerance required.

6.4.4 *Moisture percentage*

The moisture percentage of the roving can be established in accordance with ISO . . .[2].

6.4.5 *Size*

The filaments of each strand of the roving must be coated with a size, compatible with the material with which it is intended to be used.

The product literature shall indicate the class of coupling agent, the nature of the size, and the material with which the rovings are recommended to be used.

6.4.6 *Size content*

The size content shall be as stated in the product literature. The determination shall be performed in accordance with ISO/R 1887.

The tolerances shall be as given in table 2, unless otherwise agreed between supplier and purchaser.

TABLE 2

Nominal size content	Tolerance on mean value
Low (up to 0,8 %)	± 30 %
Medium (0,8 to 1,5 %)	± 20 %
High (over 1,5 %)	± 15 %

The size content shall be expressed as the percentage relating the mass of material removed on ignition to the mass of bare glass.

6.4.7 *Catenary*

The strands which form a roving do not always have exactly the same length. For some processing techniques it is of importance to know this difference in length, particularly in those in which the roving is processed in its original form, i.e. without being cut.

The catenary shall be measured in accordance with ISO . . .[2].

1) However in certain particular cases, by agreement between purchaser and supplier, the colour may not be uniform (for example, oven-dried rovings, roving with a tracer, etc.).

2) In preparation.

6.4.8 *Stiffness*

The rovings shall have a stiffness as given in the product literature. It can be measured in accordance with ISO . . .[1].

6.4.9 *Abrasion resistance*

The rovings shall have an abrasion resistance as given in the product literature. It can be measured in accordance with ISO . . .[2].

6.4.10 *Strand integrity*

The form in which this property can be expressed and an appropriate test method are given in ISO . . .[2].

6.4.11 *Mechanical properties*

The breaking strength of the rovings, as well as compressive, flexural and shear strength of laminates prepared from the rovings, shall be as stated in the product literature.

They shall be measured in accordance with the following ISO test methods :

Breaking strength of the roving : ISO . . .[1].

Compressive strength (rods) : ISO . . .[1].

Flexural strength (rods) : ISO . . .[1].

Flexural strength (sheets) : ISO 178 (method of preparation of sheets to be studied).

Shear strength : ISO . . .[2].

Other characteristics may be considered when corresponding test methods are standardized.

6.4.12 *Wettability*

The rovings shall have a wettability as given in the product literature. It can be measured in accordance with ISO . . .[2].

6.4.13 *Mass and dimensions of the packages*

The net mass, inner and outer diameters and the height of the packages shall be given in the product literature.

7 DELIVERY

7.1 Packaging

Rovings shall be wound to form cylindrical packages. For external unwinding the roving can be wound on a cardboard tube, which must have sufficient strength.

7.2 Packing

The packing must be such that under normal shipping conditions no damage occurs to the rovings.

7.3 Type indication

The package shall be provided with an external label. The label shall contain the following information :

- type (type of glass and size), nominal filament diameter, total linear density and also number and linear density of strands, when required;
- net mass of the package;
- any information (mentioned in the supplier's code) other than that concerning the properties mentioned above, and in particular the dimensions of the carrier tube, if used;
- name of the supplier.

8 STORAGE

Glass fibre rovings must be stored in their own, unopened packing, if possible at room temperature and under conditions of normal or subnormal relative humidity. It is recommended that rovings be stored at less than 65 % relative humidity and in no case at over 75 % relative humidity. Storage in sunlight shall be avoided.

The height of stacking shall be appropriate to the nature of the containers.

1) In preparation.

2) To be studied.