INTERNATIONAL STANDARD

ISO 2078

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Textile glass — Yarns — Designation

Verre textile — Fils — Désignation

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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 2078 was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 13, *Composites and reinforcement fibres*.

This fifth edition cancels and replaces the fourth edition (ISO 2078:1985), of which subclauses 4.1.1 and 4.2.7 have been technically revised and clause 2 updated.

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Textile glass — Yarns — Designation

1 Scope

This International Standard specifies a system of designating textile glass yarns [including single, multiple-wound, folded (plied), cabled and textured yarns, strands, slivers and rovings] based on their linear density expressed in the tex system.

This International Standard applies the rules of the single-to-fold designation given in ISO 1139 to these textile glass products.

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 2:1973, *Textiles — Designation of the direction of twist in yarns and related products.*

ISO 472:1988, *Plastics — Vocabulary.*

ISO 1139:1973, *Textiles — Designation of yarns.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 2 and ISO 472 apply.

4 Designation of a yarn

4.1 Elements of the designation

According to the definition given in ISO 1139, the designation of a yarn (single yarn, strand, sliver, ..., roving) is a condensed technical description containing the following elements.

4.1.1 Glass used

One or several letters, to specify the glass used by the manufacturer (see table 1).

Table 1

Type	General indications
E	for general purposes; good electrical properties
D	good dielectric properties
A	high alkali content
C	chemical resistance
S	high mechanical strength
R	high mechanical strength
AR	alkali resistant
E-CR	for use in acid environments

4.1.2 Type of yarn

A letter to describe the type of yarn:

— C (continuous) for continuous-filament yarns,

— D (discontinuous) for staple-fibre yarns.

NOTE 1 These letters are placed in the first group, as it is of special importance in the case of textile glass to distinguish between continuous-filament yarns and staple fibre yarns; their use makes it unnecessary to indicate the number of filaments, preceded by the symbol f, as proposed in ISO 1139.

4.1.3 Nominal diameter of fibre

A number, consisting of one or two figures, giving the nominal diameter, in micrometres, of the filament or staple fibre.

4.1.4 Linear density, direction and amount of twist and number of components

Some, or all, of the following elements, as in ISO 1139:

a) a number giving the linear density expressed in the tex system. It is strongly recommended that the tex be used as the basic unit, in which case the word "tex" can be omitted from the designation (if multiples or submultiples of the tex are used, these units shall be indicated after the value given for linear density);

b) the direction(s) of twist;[1)]

c) the amount(s) of twist, expressed in turns per metre, for the twist of the final stage, and (if necessary) in the full designation, for the twist of each intermediate stage;

d) the number of components in folding (plying) or cabling.

4.1.5 Manufacturer's code

If desired, the designation may also include the manufacturer's code, permitting the incorporation of any complementary information that does not appear among the previous elements, for example the type of size and the overall linear density. If it is included, the manufacturer's code shall be placed either before or after the designation as defined below and never between the elements of the designation [for example in the case of folded (plied) yarns having dissimilar components].

4.2 Designation of different types of textile glass yarn

Subclauses 4.2.1 to 4.2.8 give the elements that shall appear in the designation of various types of glass yarn.

4.2.1 Strands

a) the type of glass used;

b) the letter C for continuous-filament yarn;

c) the nominal diameter, in micrometres, of the filaments, followed by a space;

d) the linear density, preferably in tex [see 4.1.4 a)].

EXAMPLE EC10 40

4.2.2 Slivers

a) the type of glass used;

b) the letter D (discontinuous) for staple-fibre yarns;

c) the nominal diameter, in micrometres, of the staple fibres, followed by a space;

d) the linear density, preferably in tex [see 4.1.4 a)].

EXAMPLE ED7 190

4.2.3 Single yarns

4.2.3.1 Single continuous-filament yarns

a) the type of glass used;

b) the letter C for continuous-filament yarn;

c) the nominal diameter, in micrometres, of the filaments, followed by a space;

d) the linear density, preferably in tex [see 4.1.4 a)], followed by a space;

e) the direction of twist, followed by a space;

f) the amount of twist, expressed in turns per metre.

EXAMPLE EC9 34 Z 40

NOTE 2 When several strands are assembled in parallel and twisted together, only the overall linear density of all the strands before twisting is given.

For example, starting with four strands of EC9 34 and twisting these together, the designation of the resulting yarn is EC9 136 Z 40.

4.2.3.2 Single staple-fibre yarns

a) the type of glass used;

b) the letter D (discontinuous) for staple-fibre yarns;

c) the nominal diameter, in micrometres, of the staple fibres, followed by a space;

d) the linear density, preferably in tex [see 4.1.4 a)], followed by a space;

e) the direction of twist, followed by a space;

f) the amount of twist, expressed in turns per metre.

EXAMPLE ED7 190 Z 160

1) If the yarn has been subjected to a twisting operation, this shall be indicated by the direction of twist followed by the degree of twist. If the designation does not include any mention of twist, this shall always be taken to signify the absence of any twisting operation.

4.2.3.3 Textured yarns

a) the type of glass used;

b) the letter C or D for the designation of the original yarn (see 4.1.2);

c) the nominal diameter, in micrometres, of the filaments, followed by a space;

d) the linear density, preferably in tex [see 4.1.4 a)], before texturing, followed by a space;

e) the linear density, preferably in tex [see 4.1.4 a)], after texturing, preceded by the letter T.

EXAMPLE EC9 340 T352

4.2.4 Folded (plied) (doubled) yarns[2)]

4.2.4.1 Folded (plied) yarns having identical components

a) Full designation:

1) the designation of the single continuous-filament or staple-fibre yarns used, in accordance with 4.2.3.1 or 4.2.3.2, followed by a space;

2) a multiplication sign, ×, followed by a space;

3) the number of single continuous-filament or staple-fibre yarns, followed by a space;

4) the direction of the folding (plying) twist, followed by a space;

5) the amount of folding (plying) twist, expressed in turns per metre.

EXAMPLES

EC9 34 Z 160 × 2 S 150

ED7 190 Z 160 × 2 S 260

b) Simplified designation:

1) the designation of the single continuous-filament or staple-fibre yarns used, in accordance with 4.2.3.1 or 4.2.3.2, without indication of the direction or amount of twist [the twist of folded (plied) yarns is generally balanced], followed by a space;

2) a multiplication sign, ×, followed by a space;

3) the number of single continuous-filament or staple-fibre yarns, followed by a space;

4) the direction of the folding (plying) twist, followed by a space;

5) the amount of folding (plying) twist, expressed in turns per metre.

EXAMPLES

EC9 34 × 2 S 150

EC9 190 × 2 S 260

4.2.4.2 Folded (plied) yarns having dissimilar components

a) the designations of the single continuous-filament yarns used, in accordance with 4.2.3.1, joined by a plus sign, +, preceded and followed by a space, the whole being placed in parentheses and followed by a space;

b) the direction of the folding (plying) twist, followed by a space;

c) the amount of folding (plying) twist, expressed in turns per metre.

EXAMPLE (EC9 34 Z 150 + EC7 22 Z 150) S 100

4.2.5 Cabled yarns

a) Full designation:

The designation of the yarn used, including the direction and the amount of twist for each stage, the information for each stage being separated by a multiplication sign, ×, preceded and followed by a space.

EXAMPLE EC9 34 Z 150 × 2 S 100 × 3 Z 80

b) Simplified designation:

The twist of cabled yarns is generally balanced, and in most cases it is not necessary to know the direction and the amount of twist of each of the intermediate stages; consequently, the simplified designation for a cabled yarn shall only show the direction and the amount of final twist.

The simplified designation shall therefore consist of the following elements:

1) the designation of the single continuous-filament yarns, in accordance with 4.2.3.1, omitting the direction and the amount of twist, followed by a space;

for each intermediate stage:

2) This term is defined in ISO 1139.

2) a multiplication sign, ×, followed by a space;

3) the number of yarns involved, followed by a space;

for the final stage:

4) a multiplication sign, ×, followed by a space;

5) the number of yarns involved, followed by a space;

6) the direction of twist, followed by a space;

7) the amount of twist, expressed in turns per metre.

EXAMPLE EC9 34 × 2 × 3 Z 80

4.2.6 Multiple wound yarns[3)]

4.2.6.1 Multiple wound yarns having identical components

a) the designation of the yarn used, followed by a space;

b) a multiplication sign, ×, followed by a space;

c) the number of yarns which have been wound together.

EXAMPLE EC5 11 Z 90 × 10

4.2.6.2 Multiple wound yarns having dissimilar components

The designations of the yarns used, joined by a plus sign, +, preceded and followed by a space, the whole being placed in parentheses.

EXAMPLE (EC9 34 Z 40 + EC7 22 Z 40)

4.2.7 Rovings

a) the type of glass used;

b) the letter C for continuous-filament yarns;

c) the nominal diameter, in micrometres, of the filaments, followed by a space;

d) the overall linear density, preferably in tex [see 4.1.1 a)].

EXAMPLE EC10 2400

The overall linear density as given in the designation is equal either to the sum of the linear densities of the strands (in the case of assembled rovings) or the linear density of the single strand (in the case of direct rovings).

For assembled rovings, in particular rovings which are to be chopped, the specification of the roving will indicate the type of strand.

4.2.8 Chopped strands

The designation shall consist of the following elements:

a) the designation of the strand (see 4.2.1), followed by a space;

b) a dash, followed by a space;

c) the nominal length, in millimetres, of the chopped strands, followed by a space and the symbol mm.

EXAMPLE EC14 75 - 6 mm

NOTE 3 In the designation of the strand, the linear density given is that of the strands before the chopping process.

3) This term is defined in ISO 1139.