International Standard 1888

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Textile glass — Determination of the average diameter of staple fibres or continuous filaments constituting a textile glass yarn — Cross-section method

Verre textile — Détermination du diamètre moyen des fibres ou filaments constituant un fil de verre textile — Méthode de la section transversale

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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 1888 was developed by Technical Committee ISO/TC 61, *Plastics*.

It was submitted directly to the ISO Council, in accordance with clause 6.13.1 of the Directives for the technical work of ISO. It cancels and replaces ISO Recommendation R 1888-1971, which had been approved by the member bodies of the following countries :

Australia	Greece	South Africa, Rep. of
Austria	Israel	Spain
Belgium	Italy	Sweden
Canada	Japan	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Egypt, Arab Rep. of	Netherlands	United Kingdom
France	New Zealand	USA
Germany, F. R.	Romania	USSR

No member body had expressed disapproval of the document.

Textile glass — Determination of the average diameter of staple fibres or continuous filaments constituting a textile glass yarn — Cross-section method

1 Scope and field of application

This International Standard specifies a "cross-section method"[1] for determining the *average diameter*, i.e. the average value of the *actual diameters* (real diameters), of fibres in a textile glass staple fibre yarn or of filaments in a textile glass continuous filament yarn.

These diameters must not be mistaken for the *nominal diameter*, which is defined as the diameter used for the designation of textile glass products and which corresponds approximately to the mean real diameter of the filaments or staple fibres, expressed in micrometres and rounded to a whole number (ISO 6355).

2 Reference

ISO 6355, *Textile glass — Vocabulary.*[2]

3 Principle

Microscopical examination, by means of an eye-piece micrometer, of the cross-sectional area of a yarn mounted in a dark-coloured, non-glassy matrix, and measurement of the diameters of a given number of fibres or filaments constituting the yarn.

4 Apparatus

4.1 Platen, consisting of a flat metal plate about 1 mm thick, with a sliding part leaving a 1,2 mm diameter hole (see figure).

4.2 Viscose rayon yarns, very dark-coloured, to form a non-glassy matrix.

4.3 Razor blade, perfectly sharp.

4.4 Microscope, equipped with an eye-piece micrometer, preferably with a graticule, providing magnification of approximately 500 ×. The sensitivity of the optical system of the microscope shall permit measurements accurate to the nearest 0,1 µm in order to obtain the degree of precision required.

The precision of the measurement is a function of the magnifying power of the microscope and of the equivalent in micrometres of one division of the scale of the eye-piece of the microscope.

5 Procedure

5.1 Mounting

Surround the textile glass yarn with sufficient rayon yarns (4.2) to set the bundle thus constituted firmly into the hole of the platen (4.1). Use the sliding part to obtain this effect.

By means of the razor blade (4.3), cleanly cut off the bundle of rayon and glass yarns on both sides of and level with the platen.

Locate the platen on the object holder of the microscope (4.4) for examination of the bundle.

5.2 Location and centring of the bundle

To facilitate the location and the centring of the bundle, the field of the microscope may be increased by utilizing a lower magnification, for example 150 ×; after this, use the greater magnification and complete the centring.

The textile glass fibres or filaments show as bright discs.

Regulate the lighting to reduce the light area diffused around each disc to a minimum, while keeping enough brightness for a good reading.

Bring a section of the bundle under the scale of the micrometer.

5.3 Measurement

Turn the eye-piece so as to bring the micrometer scale parallel to the transverse movement of the object holder. Perform 25 diameter measurements of the fibres or filaments appearing under the scale of the micrometer. To this effect, slightly move the object holder transversely so that for each measurement one of the divisions of the scale of the micrometer is tangential to a fibre or filament.

1) A longitudinal method for measurement of average diameter of fibres can be used. In that case, ISO 137, *Wool — Determination of fibre diameter — Projection microscope method,* is applicable.

2) At present at the stage of draft.

If it proves to be impossible to perform 25 measurements, begin again along another transverse axis, avoiding second measurements of the same fibres or filaments. Complete the 25 measurements.

Record the number of divisions read, estimating to the nearest half division, corresponding to the diameter of each fibre or filament.

6 Expression of results

Calculate the arithmetic mean of the 25 diameter results. This value, expressed to the nearest 0,1 µm, is the average diameter of the fibres or filaments constituting the yarn. Calculate the standard deviation of the 25 diameter values.

7 Test report

The test report shall include the following particulars :

a) reference to this International Standard;

b) the average diameter of the fibres or filaments constituting the yarn;

c) the standard deviation of the individual results.

Dimensions in millimetres

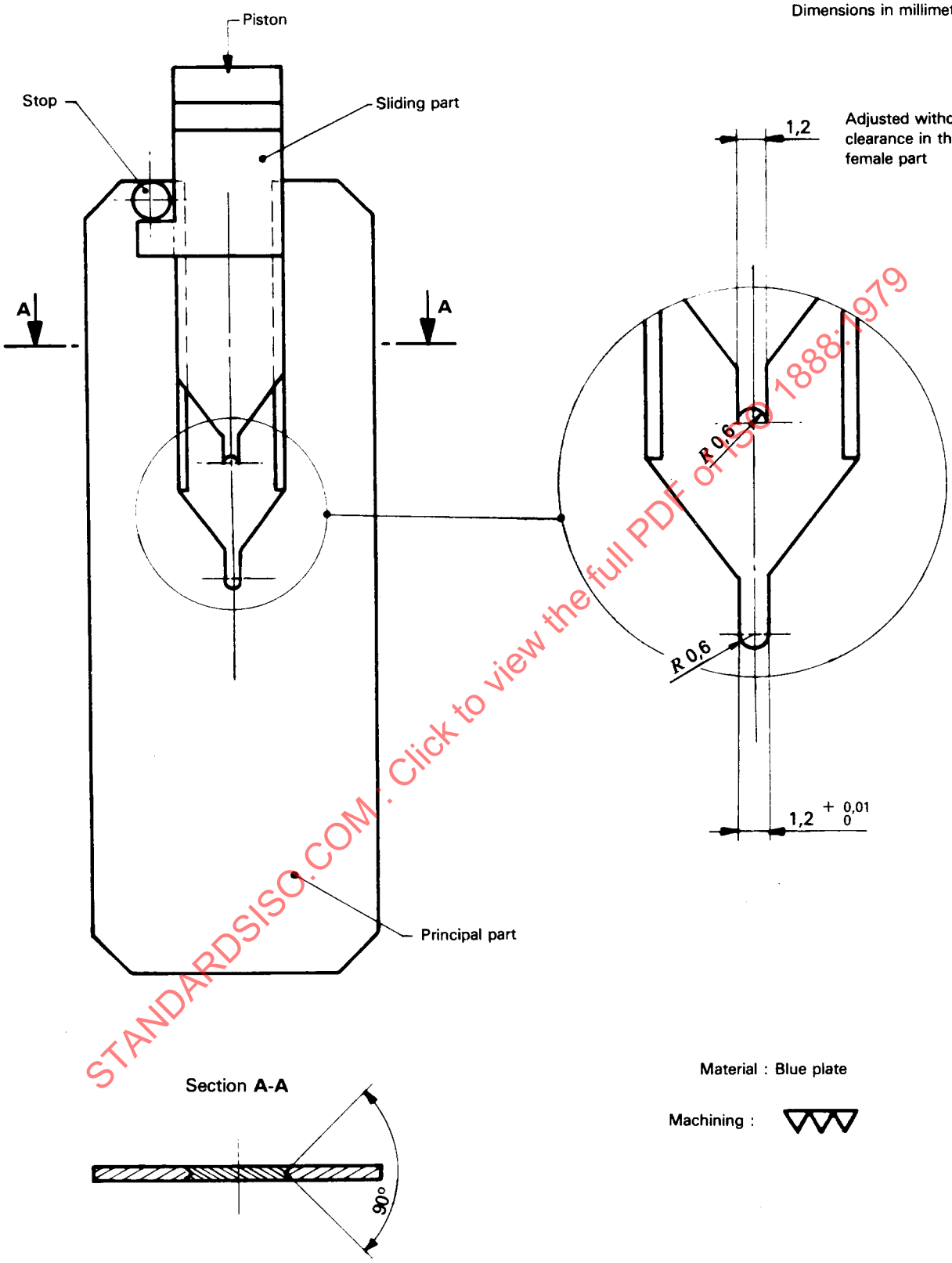

Figure — Platen (4.1)