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Textiles — Man-made fibres — Determination of shape factors in cross section

Textiles — Fibres fabriquées — Détermination des facteurs de forme dans la section

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Foreword

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This document was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 23, *Fibres and yarns*.

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Textiles — Man-made fibres — Determination of shape factors in cross section

1 Scope

This document specifies methods for the determination of shape factors in the cross-section of man-made fibres.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2076, *Textiles — Man-made fibres — Generic names*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2076 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
shape factor
<radius> radius difference between the minimum circumscribed circle and the concentric circle internally tangent to the section

Note 1 to entry: It is expressed as a percentage of radius of the minimum circumscribed circle.

3.2
shape factor
<cross-section> area difference between the minimum circumscribed circle and the cross-section shape

Note 1 to entry: It is expressed as a percentage of area of the minimum circumscribed circle.

3.3
coefficient of perimeter
X_L
perimeter ratio between the cross-section shape and the circle shape in same area

3.4
degree of hollowness
area difference between the outer contour line of the cross-section and all hollow parts

Note 1 to entry: It is expressed as a percentage of area of outer contour line, used to express the shape factor of hollow fibres.

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3.5
coefficient of perimeter of hollowness
C_{XL}
perimeter ratio between all the hollow parts and the outer contour line

Note 1 to entry: It is used to express the shape factor of hollow fibres.

4 Principle

This method provides techniques for the assessment of the cross-sectional shape of man-made fibres, based on contour lines, measured radii and perimeters, calculated area and other geometric quantities. Furthermore, the method provides techniques for the calculation of specified shape factors in the cross-sectional shape.

5 Apparatus

The usual laboratory apparatus and, in particular, the following.

5.1 Measuring microscope apparatus, which meets the following requirements:

a) stage mechanism moveable in two perpendicular directions;

b) magnification not less than 400x;

c) minimum resolvable distance of 1,5 µm;

d) digital measuring stage to measure the distance, area, perimeter, angles and other parameters.

5.2 Fibre microtome.

5.3 Sample plate, which meets the following requirements:

a) stainless metal plate;

b) 70 mm in length, 20 mm in width and 0,2 mm to 0,4 mm in thickness;

c) at least one hole passing all the way through the plate thickness.

5.4 Sharp blade.

5.5 Microscope stage micrometer, with divisions of 0,01 mm.

5.6 Auxiliary devices and materials, including:

a) glass slide;

b) cover glass;

c) anhydrous glycerol, liquid paraffin, or other mounting agents used for microscopy.

6 Testing conditions and specimen

6.1 Testing conditions

Specified atmospheric conditions are not required, it is sufficient to perform the tests under ambient room conditions.

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