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Textiles — Synthetic filament yarns — Test method for crimp properties of textured yarns

Textiles — Fils de filaments synthétiques — Méthode d'essai des propriétés de frisure des fils texturés

FDIS stage

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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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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Field Code Changed

Textiles — Synthetic filament yarns — Test method for crimp properties of textured yarns

1 Scope

This document specifies a test method for crimp properties of synthetic textured filament yarns.

Two treatment methods for crimp development are provided:

— Method A: Hot air method, and

— Method B: Hot water method.

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 139, Textiles — Standard atmospheres for conditioning and testing

ISO 3534-1, Statistics — Vocabulary and symbols — Part 1: General statistical terms and terms used in probability

ISO 3696, Water for analytical laboratory use — Specification and test methods

ISO 10132, Textiles — Textured filament yarn — Definitions

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10132 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/ui

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

3.1
crimp modulus
ratio of difference between the straightened length (L_g) and the length (L_f) of the yarn under a low tension, to the straightened length (L_g), as to characterize the elongation behaviour of a textured yarn in the range of crimp elasticity

Note 1 to entry: It is expressed as a percentage.

4 Principle

Textured filament yarns have a certain crimp trend. By certain methods, the crimp is gradually revealed. The variations in lengths, measured in crimped state and in straightened state, are used to calculate crimp

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contraction and other parameters, as to characterise crimp properties of textured filament yarns. The test specimen is in the form of a skein or a simple loop.

5 Reagent

5.1 Aqueous solution

If crimp development Method B~~— Hot water method~~ (see 10.1.12) is selected,~~-~~ distilled water or grade 3 water in accordance with ISO 3696 shall be used, to which a non-ionic surfactant to a concentration of 0,1 g/l has been added. Different concentrations of non-ionic surfactant may be allowed on agreement between the interested parties.

6 Apparatus

6.1 Skein winding reel

a) ~~a)~~ Reel, with a circumference of (1 000 ± 2,5) mm, driven either automatically or manually;

b) ~~b)~~ Traversing mechanism, to avert overlapping while a number of skeins being wound at the same time;

c) ~~c)~~ Tensioning device, maintaining the specified tension to an accuracy of ±-10 %;

d) ~~d)~~ Device to count the turns of the reel, preferably warning or stopping winding automatically, just prior to the specified number of reel revolutions;

e) ~~e)~~ Suitable mechanism to reduce the reel circumference for easy removal of the skein.

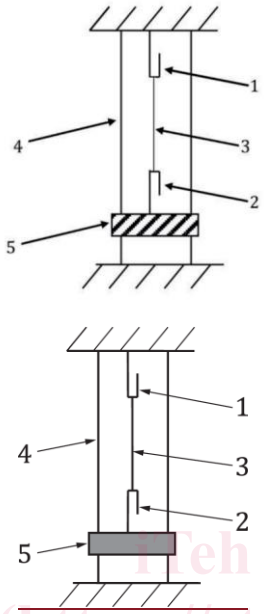
6.2 Test specimen holder

a) ~~a)~~ Frame, with a row of hooks separately on the upper and lower ends, for hanging test specimens vertically (~~See Figure 1),~~see Figure 1). In order to prevent slipping inside the knotted ends, especially for coarse yarn test specimens, the upper hooks possibly to be replaced by a clamping mechanism, while every test specimen consisting of a simple loop in "U" shape, as to eliminate the need for knot;

b) ~~b)~~ Upper hooks or clamps fixed on the frame;

c) ~~c)~~ Lower hooks subjected to applied tension, moving without friction along the wires on both sides to avoid test specimens twisting;

d) ~~d)~~ Over 600 mm in height, with test specimens adequately spaced apart so as not to touch each other.



Key

1 upper hook or clamp
2 lower hook
3 test specimen
4 wire
5 tension load

Figure 1 —. Schematic diagram of ~~Test~~test specimen holder

6.3 Device for length measurement

a) ~~a)~~ Device to measure the lengths of test specimens in vertical position;

b) ~~b)~~ Allowing to apply different tensions, either manually or automatically;

c) ~~c)~~ Equipped with a suitable length measuring system, to an accuracy of ±-0,1 mm.

6.4 Ventilated oven

a) ~~a)~~ Equipped with adequate ventilation to reach the specified temperature within the range from 30 °C to 130 °C and to maintain a temperature variation within ±-2 °C in the immediate vicinity of the test specimens;

b) ~~b)~~ Interior with a height of at least 600 mm to accommodate the test specimen holder ~~(6.2, Figure 1)~~(6.2, Figure 1) in an upright position, and with sufficient volume in which the test specimen holder ~~(6.2, Figure 1)~~(6.2, Figure 1) does not occupy more than 80 % of the volume;

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c) ~~c)~~ Capable to hold test specimens including tension loads at lower ends in vertical position, without contacting the interior sides of the oven.

6.5 Hot water container

a) ~~a)~~ Device equipped with a heater and temperature controller, capable to be set at 100 °C and to maintain the temperature variation within ±-3 °C in the immediate vicinity of the test specimens;

b) ~~b)~~ Interior with a height of at least 600 mm high to accommodate the test specimen holder ~~(6.2, Figure 1)~~(6.2, Figure 1) in an upright position and assure the test specimen holder ~~(6.2, Figure 1)~~(6.2, Figure 1) completely immersed by hot water;

c) ~~c)~~ If necessary, the container may be equipped with a mechanism to fix the test specimen holder.

6.6 Device for tension application

a) ~~a)~~ Device with loading mechanism, to apply different tensions at the bottoms of test specimens, either manually or automatically;

b) ~~b)~~ During application, avoiding the tension overshooting the target value more than 10 %.

7 Sampling

Sampling shall be performed as follows:

a) ~~a)~~ bulk laboratory sample shall be taken on request;

b) ~~b)~~ the number of lot sample and laboratory sample are listed in ~~Table 1.~~Table 1.

Packages that have been dampened, bruised, or opened during the transportation shall not be sampled.

Elapsed time between processing and testing has a significant effect on the results of crimp properties testing (caused by stress decay), especially during the first 72-h. Therefore, laboratory sample shall be chosen from the packages of same elapsed time, and not earlier than 5-days after processing. However, after an elapsed time of 7-days, the effect of stress decay may be neglected.

~~Table~~

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