

Textiles — Multifilament yarns — Methods of test for textured or non-textured filament yarns

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National foreword

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English Version

Textiles - Multifilament yarns - Methods of test for textured or non-textured filament yarns

Textiles - Multifilaments - Méthodes d'essais pour la frisure des fils multifilaments texturés et le retrait thermique des fils plats et textures

Textilien - Multifilamentgarne - Prüfverfahren für texturierte und nicht texturierte Multifilamentgarne

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Foreword

This European Standard (EN 14621:2005) has been prepared by the Technical Committee CEN /TC 248 "Textiles and Textile Products", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

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1 Scope

This European Standard specifies test methods for quality control of textured and non-textured multifilament synthetic yarns. It includes the following test methods:

- determination of the crimp contraction - textured multifilament yarn with linear density up to 500 dtex;
- determination of the hot air shrinkage - for non-textured and textured multifilament yarns;
- determination of the boiling water shrinkage - for non-textured and textured multifilament yarns.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 139, *Textiles — Standard atmospheres for conditioning and testing (ISO 139:2005)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

crimp contraction

contraction of a textured filament yarn resulting from the development of crimp, expressed as a percentage of its original length, with the lengths of the contracted and straightened yarns measured under specified tensions

3.2

thermal shrinkage

decrease in length of a textured or non-textured filament yarn as a result of a thermal treatment (boiling water or hot air), expressed as a percentage of its original length

3.3

linear density

mass per unit length of a multifilament yarn as defined in EN ISO 2060

3.4

tension

tensile force applied to the specimen, generally related to its linear density

3.5

pre-tension

tension applied to a specimen at the beginning of certain tests

3.6

straightened length

length of the specimen measured under a high tensile force, which straightens the skein without stretching

3.7

contracted length of textured yarn

length of the specimen measured under a low tensile force after a specified recovery time has elapsed

3.8**package**

form of presentation of the multifilament yarn, e.g. spool, cheese, cone, bobbin etc.

3.9**multifilament yarn**

yarn composed of several filaments

4 Test methods**4.1 Determination of the crimp contraction****4.1.1 Principle**

The crimp of a specimen of a textured filament yarn in the form of a skein of known nominal linear density is developed by treatment with hot air while the specimen is subjected to a low tensile force. After reconditioning, the straightened length of the skein is measured under a high tensile force. After a specified recovery time, the contracted length of the skein, shortened by the effect of the yarn crimp, is measured under the low tensile force.

Crimp contraction is calculated as the difference between the two length values related to the straightened length.

4.1.2 Apparatus**4.1.2.1 Reel**

A reel with a circumference of $(1\,000 \pm 2,5)$ mm is used for winding the yarn skeins. The reel shall be fitted with a device to provide the specified tensile force per unit linear density to the material being wound on with the maximum possible accuracy and to maintain the separation between a number of skeins wound at the same time.

4.1.2.2 Automatic testing device

A suitable testing device (see Figure 1) uses a loading apparatus, which extends the skein at a speed of $(1\,000 \pm 10)$ mm/min until the pre-set tensile force is reached at which the yarn crimp is pulled out, and which determines the straightened skein length related to that tensile force.

NOTE The speed of the loading apparatus may be reduced e.g. in case of less extensible textured yarns, for example to 250 mm/min, provided that this is clearly stated in the test report. Only test results obtained with identical speeds may be compared.

The same apparatus determines in a second measurement the contracted length of the skein under a low tensile force provided by a pre-tension weight attached to the skein or a hook-shaped pre-tension weight attached to the skein.

Resolution of the length measurement is 0,05 mm or better.

A number of skeins are arranged in a holder, with the skeins being tested in succession. The holder can be removed from the automatic testing device.