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Replacing GB/T 14346-1993

Man-Made Fiber – Testing Method for Unevenness of Filament Yarns – Capacitance Method

化学纤维 长丝条干不匀率试验方法 电容法

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Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 14346-1993 *Testing Method for Yarn Irregularity of Man-Made Filament Yarns by means of Electronic Evenness Tester*.

The major differences between this Standard and GB/T 14346-1993 are as follows:

- Adjust the standard name;
- Delete the provisions of linear density in the scope (see Clause 1 of this Edition; Clause 1 of 1993 Edition);
- Adjust the normative references (see Clause 2 of this Edition; Clause 2 of 1993 Edition);
- Add the clause on terms and definitions (see Clause 3 of this Edition);
- Modify the description of principle (see Clause 4 of this Edition; Clause 3 of 1993 Edition);
- Modify the description of apparatus; add the compressed air (see Clause 5 of this Edition; Clause 4 of 1993 Edition);
- Modify the sampling requirements (see Sub-clause 6.1; Clause 6 of 1993 Edition);
- Modify the atmosphere requirements for humidifying and test, pre-humidifying requirements, and humidifying time (see Sub-clause 6.3 of this Edition; Clause 5 of 1993 Edition);
- Change the title of Clause 7 into test procedures; delete the apparatus inspection from Clause 7 and modify its contents (see Clause 7 of this Edition; Clause 7 of 1993 Edition).

This Standard was proposed and under the jurisdiction of China National Textiles and Apparel Council.

Drafting organizations of this Standard: Shanghai Textile Industry Institute of Technical Supervision, Rongsheng Petrochemical Co., Ltd., Tongkun Group Co., Ltd., Guangdong Xinhui Meida Nylon Co., Ltd., and Sinopec Yizheng Chemical Fiber Co., Ltd.

Chief drafting staffs of this Standard: Zhou Zhende, Yang Meijuan, Xu Guangyu, Sun Yanlin, Song Ming, Zeng Xiaoling.

The historical edition replaced by this Standard is as follows:

Man-Made Fiber – Testing Method for Unevenness of Filament Yarns – Capacitance Method

1 Scope

This Standard specifies the testing method for unevenness of filament yarns of man-made fiber.

This Standard is applicable to the filament of man-made fiber except the spandex filament.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 4146.1 Textiles – Man-Made Fibers – Part 1: Generic Names

GB/T 4146.3 Textiles – Man-Made Fibers – Part 3: Terms of Inspection

GB/T 6502 Sampling Method of Man-Made Filament Yarns

GB/T 8170 Rules of Rounding off for Numerical Values & Expression and Judgement of Limiting Values

GB 9994 The Convention Moisture Regains of Textiles

GB/T 14343 Testing Method for Linear Density of Man-Made Filament Yarns

3 Terms and Definitions

The following terms and definitions and those ones stipulated in GB/T 4146.1 and GB/T 4146.3 are applicable to this document.

3.1 Yarn mass irregularity (CV or CV_m)

at each equal interval is changed into the corresponding electrical signals; calculate the percentage between standard difference of all electrical signals of filaments passing through the capacitor length and the mean values, which is the yarn mass irregularity.

The yarn mass irregularity (CV or CV_m), mean deviation unevenness (U) specified in this Standard are the values measured under normal test type conditions.

5 Apparatus and Ancillary Equipment

5.1 Capacitive yarn evenness meter

The apparatus requirements are as follows:

- several measuring slots consist of the plate capacitors with different specifications; each measuring slot measures the linear density within different ranges; total linear density range is continuous without any interval. The length of the capacitor pole plates along the filament movement direction is 17mm;
- The transition and transmission mechanisms that can make the filament pass through the measuring slot with certain speed;
- Twisting mechanism: make filament pass through the measuring slot in approximate circular cross-section; there are S-twist and Z-twist directions. When measuring the single-filament, no twisting shall be carried out;
- Signal processing: calculate and display the yarn mass irregularity value, spectrogram, evenness diagram, and other statistical values;
- Test results (numerical, graphic, etc.) output device.

5.2 Compressed air

The pressure and flowrate shall be determined as per the capacitive yarn evenness meter.

6 Test General

6.1 Sampling

The sampling requirements are as follows:

- Spare parts of laboratory samples shall be taken out as per the demand;
- Batch of laboratory samples shall be taken out as per the provisions of GB/T

7.5 Specimen operation

Introduce the filament into the measuring slot and transmission mechanism; make the filament operate at the setting speed.

Adjust the filament tension, twist sense and twist number till the filament without shaking or balloon; and till the yarn mass irregularity value is minimum or amplitude recorded on the evenness diagram is minimum.

7.6 Setting of mean value

Manually or automatically set the mean value on the apparatus according to the average cross section of the filament indicated on the apparatus. When measuring a batch of filaments with the same nominal linear density, and the change of mean values for each package is small, it can be subject to the setting value initially.

7.7 Acquiring data

When time counting is started, record the electrical signals transferred by the filament mass at each equal interval till the test time is set. Use all electrical signal values to calculate the test results.

Repeat Procedures 7.4~7.7, test the remaining packages.

8 Calculation and Representation of Test Results

8.1 Test results

8.1.1 The test results mainly include the following items: yarn mass irregularity, mean deviation unevenness, spectrogram, and CV-length curve, etc. If specially required, there is half-inert.

8.1.2 When testing a batch of specimens, the mean values of yarn mass irregularity, and mean deviation unevenness shall be calculated.

8.1.3 The test results shall be rounded off to two decimal places according to the provisions of GB/T 8170.

8.2 Approximate conversion of mean deviation unevenness and yarn mass irregularity

In the case where the abnormal long fragment unevenness of filament doesn't exist, the two can be approximately converted as per Formula (1):

$$CV \approx 1.25U \quad \dots\dots\dots (1)$$

Where:

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