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Wayne Zheng et. al

Sales@ChineseStandard.net

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**NATIONAL STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA**

GB/T 14344-2008

**Testing method for tensile of
man-made filament yarns**

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Foreword

The consistent degree of tensile density in this Standard is not equivalent to that in BISFA-2004 *Polyester Filament Yarn Test Methods*, BISFA-2004 *Nylon Filament Yarn Test Methods*, and BISFA-1997 *Viscose, copper ammonium, Acetate, Triacetate, Lyocell Filament Yarn Test Methods*.

This Standard shall replace GB/T 14344-2003 *Synthetic Fiber Filament Tensile Performance Test Methods*.

Compared with GB/T 14344-2003, the major changes of this Standard are as follows:

----- The scope of application is modified: it is expanded from synthetic fiber filament to cellulose fiber filament (See Chapter 1);

----- Rounding off for calculation results is modified (8.1, 8.9 in the 2003 edition; 8.8 in this edition);

----- Humidity condition, standard atmospheric conditions for test and the time are modified (Chapter 6 in the 2003 edition; 6.2 in this edition);

----- Requirements on sampling of bulk items are added (see 6.1.1);

----- The pre-tension load calculation is added (see 6.3.1);

----- The part of statistics in the original standard is adjusted to be Annex C in this Standard.

Annex C of this Standard is normative, while Annex A and Annex B are informative.

This Standard was proposed by China Textile Industry Association.

This Standard shall be under the jurisdiction of Shanghai Textile Industry Technical Supervision Institute.

This Standard was drafted by organizations: Jiangsu Hengli Chemical Fiber Co., Ltd., Textile Industry Chemical Fiber Products Quality Supervision Center, Petroleum Industry Synthetic Fiber Quality Supervision and Inspection Center, Jiangsu Shenghong Chemical Fiber Co., Ltd., Baoding Tiane Chemical Fiber Co., Ltd., Xinxiang Chemical Fiber Co., Ltd.

The main drafters of this Standard are: Ding Jianzhong, Lu Xiuqin, Zhang Yushi, Cheng Qian, Chen Jieling, Liu Chufeng, Lei Ming.

The previous versions replaced by this Standard are as follows:

----- GB/T 14344-1993 and GB/T 14344-2003.

Testing method for tensile of man-made filament yarns

1 Scope

This Standard specifies the method for testing tensile performance of chemical filaments, such as polyester (terylene), polyamide (nylon), polypropylene (PP) filament and cellulosic fiber.

This Standard applies to chemical filaments (pre-oriented yarn, drawn yarn, textured yarn and so on). This Standard can be used as reference for the chemical filament extracted from textile.

This Standard does not apply to the filament, of which the elongation percentage is larger than 0.5% when the tension is increased from 0.05cN/dtex to 0.1cN/dtex.

2 Normative references

The articles contained in the following documents have become this Standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB/T 3291.1 Textiles--Terms of textile material properties and test--Part 1: Fibre and yarn

GB/T 3291.3 Textiles--Terms of textile material properties and test--Part 3: General

GB/T 6502 Sampling method of man-made filament yarns

GB/T 6529 Textiles—Standard atmospheres for condition and testing

GB/T 8170 Rules of rounding off for numerical values & expression and judgment of limiting values

GB/T 14343 Testing method for linear density of man-made filament yarns

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions given in GB/T 3291.1

and GB/T 3291.3 shall apply to this Standard.

4 Principle

Under prescribed conditions, ELONGATE fiber on the CRE tester until it is fractured, then OBTAIN testing value of sample fracture strength, fracture elongation, constant load elongation, load at constant elongation, initial modulus, rupture work and other tensile performance according to strength-elongation curve or data display or data acquisition system.

5 Devices and materials

5.1 CRE tester, the sample can be loaded by manual control or automatic loading device.

The instrument shall be equipped with the following devices:

- a) Electronic measuring devices.
- b) The automatic recorder or data acquisition system that can draw strength-elongation curve. Data acquisition speed of data acquisition system shall be high enough to meet the requirement that the maximum allowable difference between actual and indicating strength shall be less than 1% of the actual strength and the maximum allowable difference between real and indicating elongation shall be less than 0.5mm.
- c) Gripper. Gripper shall meet the following requirements:
 - 1) The gripper can grip sample F within the specified gauge length;
 - 2) At least 250mm gauge length setting shall be achieved by the gripper;
 - 3) The speed variation shall be less than 4% when the movable gripper moves at a constant speed;
 - 4) During the continuous test, maximum allowable difference for the movable gripper to return to different initial positions shall be less than 0.25 mm;
 - 5) The gripper shall be able to strip the sample, with no slip and no sample fracture at the holding point due to sample damage.

Note 1: The typical jaw of gripper shall be flat and without liner; but if it can't prevent the slip of the sample, other forms of gripper can be adopted according to the agreement, for example, the gripper with liner or cable-pillar-type gripper.

Note 2: As the type of gripper will have certain effect on fracture elongation rate of sample, the related

laboratory samples according to the C.3. CALCULATE standard deviation of arithmetic mean of each group of single values TO the total arithmetic mean of each laboratory samples according to C.5. The confidence region of total arithmetic mean can be calculated by that standard deviation, at here the n is the number of laboratory samples to be tested.

C.8 Redetermination of test number

SAMPLE laboratory samples according to requirements of GB/T 6502. If they failed to achieve the required confidence region, it is necessary to increase the number of tests. If it has already done n times of test, COMPUTE the standard deviation s or coefficient of variation CV_b . If it exceeds the specified confidence region, in order to reach the required half-width value of the confidence region c^* or C^* , the number of tests shall be increased m times, m is calculated according to the formula (C.14) or the formula (C.15):

$$m = t^2 \times \frac{s^2}{c^{*2}} - n \quad \text{.....(C.14)}$$

or

$$m = t^2 \times \frac{CV_b^2}{C^{*2}} - n \quad \text{.....(C.15)}$$

In the formula:

t — The value corresponds to n in the Table C.1.

In this case, CALCULATE mean and confidence region with the test results of $(m + n)$. And INSPECT if the new confidence region meets the requirements.

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Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

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