

Translated English of Chinese Standard: GB/T16604-2008

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ICS 59.060.20

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GB

NATIONAL STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 16604-2008

Replacing GB/T 16604-1996

Polyester filament for industry

涤纶工业长丝

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Issued on: August 06, 2008

Implemented on: June 01, 2009

**Issued by: General Administration of Quality Supervision, Inspection
and Quarantine of the People's Republic of China;**

**Standardization Administration of the People's Republic of
China**

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Foreword

This Standard replaces GB/T 16604-1996 *polyester filament for industry*.

This Standard, in comparison with GB/T 16604-1996, have the major changes as follows:

a) Scope of application is widened so that this Standard is applicable to 222 dtex-6667 dtex polyester filament for industry.

b) Super high tenacity, ultra-low shrinkage and high modulus low shrinkage products are added in the product classification.

c) The technical requirements are modified as follows:

—— Physical indexes are increased for super high tenacity, ultra-low shrinkage and high modulus low shrinkage products;

—— Assessment indexes of items such as linear density, deviation ratio, variation coefficient of linear density, variation coefficient of fracture tenacity rate, variation coefficient of fracture elongation rate in the physical indexes of high tenacity and low shrinkage products are increased with certain amount;

—— Appearance index is changed to be agreed upon by the interested Parties and indicated in the informative annex.

d) The test methods are modified as follows:

—— Standard atmospheric condition for humidity conditioning and test is determined according to BISFA, with the temperature adjusted to (20 ± 5) °C and relative humidity to $(65\pm5)\%$;

—— Time for humidity conditioning and balancing is adjusted to 4 h and 16 h for re-test;

—— Reference to GB/T 14343 for linear density test;

—— An additional set of test conditions is provided in the tensile property test: clamping length is 250 mm and tensile speed is 300 mm/min;

—— Instrumental method is additionally provided in dry heat shrinkage rate test;

—— Additional test methods are provided for index of dimensional stability;

—— Statistical method for variation coefficient is changed.

e) Number of laboratory samples specified for sampling is change from original 10 to 20.

f) Informative annex “Appearance Requirements, Inspection and Assessment” (see Annex A) is additionally provided.

Appendix A to this Standard is informative appendix.

This Standard is proposed by Textile Industry Association of the People’s Republic of China.

This Standard is under the jurisdiction of Shanghai Textile Technical Quality Supervision Institute.

Drafting organizations of this Standard: China Sinopec Shanghai Petrochemical Co., Ltd. and Wuxi Taiji Industry Co., Ltd.

Assisting drafting organizations of this Standard: Zhejiang Hailide New Material Co., Ltd.

The main drafters of this Standard are: Lin Song, Xu Qijun, Zhu Gang, Ni Meijin, Yu Xinri, Ge Junmin, and Chen Hongde.

The previous version replaced by this Standard is as follows:

—— GB/T 16604-1996.

Polyester filament for industry

1 Scope

This Standard specifies the product classification, requirements, test methods, inspection rules and mark, packaging, transportation and storage of polyester filament for industry.

This Standard is applicable to the exit-factory inspection, user acceptance, arbitration inspection, etc. for polyester filament for industry with linear density of 222 dtex-6667 dtex and it can be used for reference for other products.

2 Normative references

The articles contained in the following documents have become part of 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 1250 Rules for expression and judgment of limiting values

GB/T 2828.1-2003 Sampling procedures for inspection by attributea-Part1: Sampling schemes indexed by acceptance quality limit(AQL) for lot-by-lot inspection

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 4146 Textile terms and terminology(parts of chemical fibers)

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

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

6 Test methods

6.1 General rules

6.1.1 Humidity conditioning and standard atmosphere for the test

Standard atmospheric condition for humidity conditioning and test is determined according to BISFA, with the temperature of $(20\pm 5)^\circ\text{C}$ and relative humidity of $(65\pm 5)\%$.

6.1.2 Sample preparation

20 laboratory samples taken in accordance with the requirements in 7.4.2 are placed under the standard atmospheric condition specified in 6.1.1 for humidity balancing for 4 h. If it is re-inspection, it shall be placed under the standard atmospheric condition specified in 6.1.1 for humidity balancing for 16 h. After humidity balancing for laboratory sample, surface filament of 200 m shall be peeled off before taking the test sample prior to the test.

6.2 Linear density

Reference to GB/T 14343 for linear density test; Standard atmosphere for humidity balancing and test shall be executed in accordance with the requirements in 6.1.1. Pre-tension for unit linear density is required to be: $(0.05\pm 0.005)\text{cN/dtex}$.

6.3 Tensile property

6.3.1 Principle

Under specified conditions, strong tensile tester is used to pull the test sample until it breaks to get the fracture tenacity, fracture elongation rate, elongation rate under constant load and other measured value of tensile properties.

6.3.2 Instruments

Strong tensile tester with constant rate of elongation (CRE)

6.3.2.1 Strong tensile tester with constant rate of elongation shall be provided with the following devices:

- a) Devices that can indicate or record the load applied to the test sample and the corresponding elongation.
- b) Automatic recording or data collecting system that can map out tensile curve.
- c) The gripper that can effectively hold the test sample. The gripper can be the

A.2.3.2 Rotate on the classification device for a cycle to observe two end faces and one column surface of the package.

A.2.3.3 Inspect each tested package as per items required by A.1.2.

A.2.3.3.1 Existence of broken filament is confirmed if the filament looks fuzzy or the broken end of monofilament protrudes out of multifilament surface and can be seen against the light.

A.2.3.3.2 Surface contamination refers to oily filament and rusty filament that can be seen by visual inspection and spots that can hardly washed off with water, and shall be calculated in area.

A.2.3.3.3 Inspection of cob-webbing yarn (over-thrown yarn) is to calculate quantity of packages with filament yarn on both ends separating from normal winding path.

A.2.3.3.4 Weigh mass of the package, deduct the known mass of wrapper, and the resulted net mass is bobbin weight, which shall be precise to 0.5%.

A.2.3.4 Record results.

A.3 Evaluation rules

A.3.1 Broken filament

It means that the filament is damaged and looks fuzzy, or the broken end of monofilament protrudes out of multifilament surface. Inspect entire surface of the package. The level is determined according to accumulated number of broken filaments of each package.

Coiled filament (unbroken monofilament), a kind of broken filament, refers to arc-like monofilament that is shown on package surface and has a height greater than 2mm. For inspection, calculate number of broken filaments.

A.3.2 Surface contamination

Oily filament, rusty filament, and dirty spots that can hardly washed off by water, or human-caused stains on package surface. The level is determined as per total area of contaminated region on the surface of packaged filament.

A.3.3 Cob-webbing yarn

Cob-webbing yarn is defined as tows separated from normal winding path and more than 2cm in length. The level is determined based on total numbers of cob-webbing yarns of

two end surfaces of each package.

A.4 Comprehensive grading

The lowest grade in appearance items is deemed as the grade of the package.

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