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FZ

**TEXTILE INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

FZ/T 30003-2024

Replacing FZ/T 30003-2009

**Textiles - Quantitative analysis of bast fibres and cotton
blended - Light microscopy method
(English Translation)**

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Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document replaces FZ/T 30003-2009 "Method for quantitative analysis of ramie (flax hemp)cotton blended textile - Micro projection"; compared with FZ/T 30003-2009, in addition to structural adjustments and editorial changes, the main changes are as follows:

- CHANGE the standard name into "Textiles - Quantitative analysis of bast fibers and cotton blended - Light microscopy method";
- CHANGE the "Digital image analyzer" into "Digital fiber analyzer"; ADD the hemp fiber to the scope of application (see Chapter 1);
- DELETE GB/T 6529 "Textiles - Standard atmospheres for conditioning and testing" (see Chapter 2 of the 2009 edition);

- ADD the "Terms and definitions" (see Chapter 3);
- DELETE the "RM fiber colorant"; ADD the "transparent colorless nail polish", "sodium hypochlorite", "N,N-dimethylformamide" (see Chapter 5);
- CHANGE the sampling method for "loose fibers", changing the fabrics into two parts: "Woven fabrics" and "Knitted fabrics" (see 7.1.2);
- MOVE the "Specimen coloring" into Appendix A, changing the dye into zinc chloride-iodine dye; adding the test steps of "De-sizing" and "Fading" (see 7.2);
- ADD the "Number of slides to be made" (see 7.3.1);
- DIVIDE the "Measurement" in "Test steps" into two measurement methods: "Method A: Measurement with a micro projector" (see 7.4.1) and "Method B: Measurement with a digital fiber analyzer" (see 7.4.2), adding the conditions that shall be excluded when measuring the diameter (see 7.4.1.2);
- ADD the "Calibration magnification" (see 7.4.1.1) and "Calibration system scale" (see 7.4.2.1);
- ADD the calculation formula for apocynum fiber (see Chapter 8);
- CHANGE the numerical rounding of test results (see Chapter 9);
- ADD the content to be included in the test report (see Chapter 10);

1 Scope

This document describes the test method for quantitative analysis of hemp-cotton blended products using an light microscope (including micro projector and digital fiber analyzer).

This document is applicable to ramie-cotton, flax-cotton, hemp-cotton, hemp-cotton blended products.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, for dated references, only the version corresponding to that date applies to this document. For undated references, the latest version (including all amendments) applies to this document.

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

FZ/T 01057.3 Test method for identification of textile fibres - Part 3: Microscopy

3 Terms and definitions

There are no terms and definitions that need to be defined in this document.

4 Principle

Both hemp and cotton fibers have unique appearance characteristics. This method uses an optical microscope (including micro projector and digital fiber analyzer) to identify and count a certain number of fibers; measures the fiber diameter or cross-sectional area to calculate the mass percentage of various fibers.

5 Reagents

5.1

Distilled water or deionized water.

5.2

Collodion or colorless transparent nail polish.

5.3

Anhydrous glycerin or liquid paraffin.

5.4

Sodium hypochlorite

1 mol/L.

5.5

N,N-dimethylformamide

Analytical pure.

6 Instruments and equipment

6.1

Optical microscope including micro projector and digital fiber analyzer.

6.1.1

Micro projector

Magnification of at least 400 times.

6.1.2

Digital fiber analyzer

It shall include microscope, camera, computer, acquisition card, special analysis software, display. The microscope shall be able to provide at least 500 times magnification. It shall be

accompanied by a micrometer scale for calibrating the instrument magnification.

6.2

Oven

Capable of maintaining a temperature of $105\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.

6.3

Fiber slicer.

6.4

Slide (thickness is the same as the thickness of the objective micrometer glass), cover glass, watch glass, scissors, tweezers, blade, etc.

6.5

Wedge ruler

It is printed with a scale of 500 times magnification. A movable linear regular scale with millimeter scale can also be used.

7.1.1 Qualitative analysis

Perform according to FZ/T 01057.3.

7.1.2.1 Loose fibers

Uniformly and randomly extract about 10 g of fiber from the laboratory sample; lay the test sample flat on the test bench; use tweezers to randomly extract about 0.5 g of fiber from different parts of the front and back sides (no less than 10 points on each side); mix them thoroughly and divide them into three parts as evenly as possible. Slightly arrange the fiber bundles so that the fibers are basically parallel.

7.3.2 Preparation of longitudinal section slide specimens

Use a fiber slicer to cut fiber segments of about 0.2 mm ~ 0.4 mm in length from the middle of the fiber bundle. Each fiber bundle shall be cut only once and shall not be cut repeatedly. Place all the fiber segments on a watch glass; drop an appropriate amount of liquid paraffin or glycerin; stir with tweezers to evenly distribute them in the medium.

Then take an appropriate amount of specimen and place it on the slide; spread it evenly; cover it with a cover glass to fix the sample; be careful not to let the fibers flow out of the slide to avoid fiber loss. For ease of detection, the specimen can be made using one slide and two cover glasses. At least 500 fibers shall be detected under one cover glass.

Other specimen preparation methods that can meet the requirement of not less than 1000 fibers can also be used.