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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 14593-2026

Replacing GB/T 14593-2008

Quantitative analysis of animal fibres such as cashmere and wool

山羊绒、绵羊毛等动物纤维定量分析方法

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 14593-2008 "Quantitative Analysis Methods for Cashmere, Sheep Wool and Their Blended Fibers - Scanning Electron Microscopy", except for the following. Aside from structural adjustments and editorial changes, the main technical changes are as follows:

---The operating conditions for scanning electron microscopes have been changed (see 4.2,

7.2 in the.2008 edition);

---The requirement for sample preparation has been added (see 4.3.2);

---The fiber qualitative testing procedure has been modified (see 4.5,

9.1 in the.2008 edition);

---The requirements for sample preparation of yarns, fabrics, and knitted fabrics have been deleted (see sections 8.1.2, 8.1.3, and

8.1.4 in the.2008 edition);

---A method for calculating fiber diameter has been added (see 4.7.1);

---Added requirements for reporting test results (see 4.7.3);

---Experimental methods for optical microscopy have been added (see Chapter 5);

---Added requirements for test reports (see Chapter 6). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Fibers (SAC/TC513). This document was drafted by: Inner Mongolia Autonomous Region Fiber Quality Monitoring Center, Inner Mongolia Erdos Resources Co., Ltd., and the Textile Industry. Standardization Research Institute, Jiangsu Aoyang Textile Industry Co., Ltd., Wuhan Textile University, Inner Mongolia Dongke Textile Testing Service Co., Ltd. Guangzhou Inspection, Testing & Certification Group Co., Ltd., China Textile Information Center, Inner Mongolia Luwang Cashmere Co., Ltd., and China United Inspection (Beijing) Testing Center Technology Co., Ltd. The main drafters of this document are. Li Xiaomei, Gao Lizhong, Si Ying, Li Lei, Tang Wenyang, Wang Li, Dai Lingjie, Meng Linghong, Yao Miaomiao, and Pang Ruidong. Wang Longwei, Yi Hong, Ren Zhibo, Hongxia, Ding Hui, Zhang Huan. The release history of this document and the document it replaces is as follows:

---First published in.1993 as GB/T 14593-1993, and revised for the first time in.2008;

4 Scanning electron microscopy (SEM) imaging method

4.1 Principle The high-energy electron beam generated by the electron gun of a scanning electron microscope is incident on the sample surface, exciting the sample surface to generate secondary electrons and other substances. The physical signal is collected and imaged by a secondary electron detector. The obtained sample surface morphology images are compared with those of scales from different known types of animal fibers. Fiber types are identified by comparing morphology, scale density, and scale thickness. This is based on the observed fiber type and the number of fiber segments, as well as measurements... The diameter is obtained, and the mass fraction of each type of fiber is calculated based on the fiber density.

4.2 Reagents, Instruments and Equipment

4.2.1 Scanning Electron Microscope. Functional requirements of a scanning electron microscope.

a) It consists of a vacuum system, an electro-optical system, a signal acquisition and

imaging system, a display system, and measurement software;

b) Image acquisition mode. Secondary electronic image;

c) Operating voltage. 1kV~10kV;

d) Beam current. less than 5.0 x 10^-6 A;

e) Secondary electron image resolution >= 20nm;

f) Magnification. 30x to 10000x.

4.2.2 Vacuum sputtering or ion sputtering apparatus, with gold (Au) or platinum (Pt) as the target. If the sample has no charge effect under the working voltage, further processing is not required. Spray plating treatment.

4.2.3 Glass test tubes with a diameter of 10mm~15mm and stirring rods with a diameter of about 1mm.

4.2.4 A rectangular or square glass plate with a side length of about 15cm.

4.2.5 Acetone or ethyl acetate (analytical grade). This reagent is harmful to the human body; appropriate protective measures should be taken when using it.

4.2.6 Specimen holder. Specimen holder with a diameter of not less than 10 mm or other specimen holder that meets the test requirements.

4.2.7 Conductive double-sided tape.

4.2.8 Electronic balance, scale division

0.1 mg.

4.2.9 Hastings slicer or other types of fiber slicers.

4.3 Sample

4.3.1 Sample conditioning Test samples should be conditioned in the standard atmosphere specified in GB/T 6529 for at least 4 hours.

4.3.2 Sampling For loose fiber samples, lay the sample flat on the test bench and randomly select approximately 500 mg from both sides (at least 20 points) using tweezers. The samples were mixed and divided into three portions. Two portions were tested independently by two different operators, and one portion served as a backup sample. The three portions were then manually prepared. Fiber bundles that are basically parallel to each other.

4.4.1 Cut a fiber fragment of approximately

0.4 mm from each test sample using a slicer. Each sample should be cut only once and

should not be repeated. Cut.

4.4.2 Place all the fiber fragments into a glass test tube, add 1 mL to 2 mL of acetone or ethyl acetate, stir well, and then pour into the prepared solution. On a good glass plate, the suspension is distributed within a 10cm diameter area.

4.4.3 Apply the double-sided conductive adhesive to the sample holder. After the reagent on the glass plate has evaporated, gently press the sample holder onto the glass plate. (The text abruptly ends here, likely due to an incomplete sentence or missing information.) The fibers on the glass plate are aggregated, and a new sample should be prepared.

4.4.4 Five sample holders shall be made for each sample and tested as a group.

4.4.5 Apply a gold film to the sample holder containing fiber fragments using a vacuum sprayer or ion sputtering apparatus.

4.5 Testing

4.5.1 Place the sample holder into the scanning electron microscope sample chamber. At a lower magnification, select the upper left corner as the observation starting point and choose an appropriate magnification. Observe the fiber images, generally at 500x to 8000x magnification, and identify the fiber type based on the fiber appearance and structural characteristics (see Appendix A).

4.5.2 After the fiber test at the selected location is completed, move the sample holder vertically or horizontally to scan the entire sample holder.

4.5.3 If only one type of fiber is found after testing.200 fibers in the first sample holder, at least 300 fibers should be tested in the second sample holder. If no second type of fiber is found, the sample can be considered a single component, and other sample holders can be discontinued. If two types of fibers are found, the sample can be considered a single component. If the sample is considered to be a mixed fiber, then at least.200 fibers should be tested in each remaining sample holder, and at least 1000 fibers should be tested in each sample. fiber.

4.5.4 For mixed fibers, the diameter of 24 fibers of each component were measured on a single specimen holder (if less than 24 fibers, all were measured). The diameter of a total of 120 fibers was measured in the sample. If the total number of fibers in a certain component is less than 120, the average number of fibers is calculated based on the actual number measured. diameter.

4.5.5 The five sample holders in the second group were analyzed in accordance with the requirements of

4.6 Treatment of coarse wool fibers For cashmere with a fiber diameter greater than 30μm, yak wool with a fiber diameter greater than 35μm, camel wool with a fiber diameter greater than 40μm, and rabbit wool with a fiber diameter greater than 30μm... Wool fibers were