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

GB/T 47086-2026

**Test method for the mean and distribution of diameter for
reinforcement fibres and microfibre cotton - Digital optical
scanner**

增强纤维和微纤维棉直径及其分布的测定 数字光学扫描仪法

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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. 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 by the China Building Materials Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Glass Fiber (SAC/TC245). This document was drafted by: Nanjing Glass Fiber Research and Design Institute Co., Ltd.,

Jushi Group Co., Ltd., and Hangzhou Zhongrui Ruitai Composite Materials Co., Ltd. Materials Co., Ltd., Zhenshi Group Huazhi Research Institute (Zhejiang) Co., Ltd., Hangzhou Tanwei Intelligent Technology Co., Ltd., Taishan Fiberglass Zoucheng Co., Ltd. Limited Liability Company, Nanjing Sinoma Standard Certification Co., Ltd. The main drafters of this document are. Huang Sanxi, Wang Yumei, Zu Qun, Xu Qi, Zhang Yan, Guo Renxian, Han Dong, Yang Jianping, Sun Jing, Ye Fenglin, and Qiu Yunxing. Zhang Liang, Li Qiang, and Li Wei.

With the development of image recognition, computer vision, and big data analytics, an optical scanning method based on digital image analysis is gradually emerging. This method has become an important technological direction for fiber diameter measurement. It utilizes a high-resolution microscopic image acquisition system, combined with image enhancement and edge recognition. Processing techniques such as pixel size calculation are used to achieve automatic identification of fiber boundaries and accurate measurement of diameter. Compared with traditional measurement methods, this... The method has advantages such as high measurement efficiency, large sample size, and good result repeatability. It can not only reflect the average diameter, but also comprehensively describe the diameter distribution. Its fabric properties make it particularly suitable for production process monitoring and product quality control. This document aims to establish a standardized method for measuring fiber diameter using digital optical scanning, clarifying its principles, instrument configuration, sample preparation, and parameters. Key steps such as comparing samples or standard samples, plotting working curves, sample measurement procedures, and result representation are crucial to ensuring the accuracy of measurement results. reliable. This method uses a reference sample or micrometer scale to determine the image pixel size, and the accuracy of the measurement results largely depends on... The accuracy of the pixel size determination depends on the accuracy of the value. Therefore, it is necessary to select appropriate calibration equipment. When using a reference sample for determination, due to differences... Differences in refractive index and surface structure among chemically classified fibers can affect the sharpness of image edge recognition, and consequently, the pixel density. For precise dimensional calculations, a reference sample with the same chemical class as the sample being tested should be selected. The fiber diameter of the reference sample is determined by optical microscopy. Assigning values using either microscopy or scanning electron microscopy ensures that accurate reference sample diameter values are obtained through these two methods. Determination of diameter and distribution of reinforcing fibers and microfiber cotton Digital optical scanner method

1 Scope

GB/T 47086-2026 is the Chinese national standard covering measuring fibre diameters by digital optical scanning instead of by microscope and eye - thousands of fibres measured automatically, which turns a tedious estimate into a distribution with real statistics behind it.

The diameter distribution of a mineral fibre is also what governs its respirability, so this is a health measurement as much as a quality one. First edition. It was issued on 28 January 2026 and has been in force since 1 August 2026, as a first edition. The document is under the responsibility of the China Building Materials Federation. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes a method for determining the diameter and distribution of reinforcing fibers and microfiber cotton using a digital optical scanner. This document applies to reinforcing fibers with a circular or near-circular cross-section, or microfiber cotton with an average diameter of not less than 0.5 μm and its diameter. Determination of distribution.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 7690.5 Test methods for reinforcing yarns - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 18374 apply to this document.

4.Principles Fiber bundles or microfibers are dispersed into monofilaments, magnified by an optical system, and microscopic images are acquired by a rapid imaging device, then processed using image processing. The technology enables automatic fiber edge recognition and automatic pixel width measurement. A pixel width-fiber diameter ratio is established using a reference sample. Plot a curve to obtain the average fiber diameter and distribution in micrometers.

5 Equipment and Materials

5.1 Digital Optical Scanner It should include at least the following devices.

- a) Sample cell (for wet measurement), capable of holding dispersion medium and sample, with built-in stirring device to disperse aggregated fibers into monofilaments;
- b) Stage (for dry measurement), used to carry the test piece, which can move in the plane along the horizontal and vertical directions along a designed path;
- c) Test slides (for dry measurements), consisting of a glass slide and a coverslip, made of

transparent glass, with thickness and dimensions matched to the stage;

d) A microscopic image acquisition system, consisting of a light source, an imaging system, and a high-speed camera, capable of rapidly acquiring fiber microscopic images within the field of view;

e) A computer system with image processing technologies and data processing capabilities, including image enhancement, automatic image edge recognition, and automatic pixel width measurement.