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

GB/T 35378-2017

**Testing methods for the tensile mechanical properties of plant
short individual fibres**

植物单根短纤维拉伸力学性能测试方法

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard proposed by the State Forestry Administration. This standard by the National Standardization Technical Committee bamboo and rattan (SAC/TC263) centralized. This standard was drafted unit. International Bamboo and Rattan Center, Zhejiang Academy of Forestry, Beijing Forestry University, the quality of national fiber textile products Quantity Supervision and Inspection Center, Shanghai Zhong Chen Digital Technology Equipment Co., Ltd. and so on. The main drafters of this standard Wang Ge, Cheng Haitao, Yu Yan, Zhang Weifu, Zhang Shuangbao, Kong Liping, Qin Yanhua, Chen Lu Tie.

The mechanical properties of plant fibers have a direct impact on the macroscopic mechanical properties of the composites. Due to plant fiber morphology, Structure and chemical composition of the complexity and variability, its mechanical properties of the characterization experiment more difficult. In particular, some important plants are short Fiber, such as wood, bamboo and other fibers, the single fiber size is tiny, the length is generally between 1.2mm ~ 5.0mm, diameter 10 μ m ~ 50 μ m, the traditional long-fiber tensile test technology is difficult to implement. Since the.1990s, relevant researchers at home and abroad have developed the "V-groove fiber holding technology" and the corresponding test equipment, compared with A good solution to the mechanical properties of plant staple fibers in the test of fiber clamping, orientation and fiber cell wall area measurement and other key technologies Difficulties, however, are susceptibility to many factors such as instrumentation, environment, methods, samples, and experimenters when testing with this technique Resulting in poor repeatability and comparability of results. Therefore, there is an urgent need to standardize the tensile mechanical properties of single staple fiber plant experiment method. Tensile mechanical properties of single staple fiber plant

1 Scope

China's national method for measuring the tensile properties of individual short plant fibres. It specifies the principle, the test equipment, the specimen preparation and the test methods, and it applies to single plant fibres of 1.2 to 5.0 mm in length. Testing a single

fibre a few millimetres long is a genuinely difficult mechanical measurement, and the difficulty is almost entirely in the mounting: the fibre has to be gripped at both ends without being crushed or nicked, aligned with the load axis, and pulled at a controlled rate while a force of a few millinewtons is resolved. The reason to go to that trouble is that these fibres are the reinforcement in natural fibre composites and the raw material of pulp and paper, and in both the property of the bulk material follows from the property of the individual fibre and how many of them are aligned. Wood pulp fibres fall squarely in this length range, which makes the method as much a papermaking tool as a composites one.

This standard specifies the principle of mechanical properties of single staple fiber plant, test equipment, sample preparation and testing methods. This standard applies to the length of 1.2mm ~ 5.0mm plant single staple fiber (such as bamboo, wood, rattan and jute, linen and other hemp fiber) determination. Tensile mechanical properties of other lengths of single plant fiber can also be determined by reference to this standard.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document. Textile and textile materials - Performance and test terms - Part 1. Fibers and yarns

GB/T 8170 rounded repair rules and limit values of the representation and judgment Test methods for tensile properties of chemical fiber filaments

3 Terms and definitions

GB/T 3291.1 defined and the following terms and definitions apply to this document.

3.1 Tensile stress tensilestress Tensile load and fiber cross-section of the physical (excluding fiber hollow part) area ratio.

3.2 Tensile strength tensilestrength The maximum stress to which the specimen is subjected to tensile fracture.

3.3 Tensile strainstrain Under the tensile load, the length of the sample within the span of the change in the ratio of its initial length.

3.4 Tensile modulus of elasticity The tensile strain and tensile strain ratio of the specimen in the elastic range.

3.5 Stress-strain curve stress-straindiagram To strain into abscissa, stress for the vertical axis of the mapping diagram.

3.6 Elongation at break elongationatbreak Under tensile load, the ratio of the displacement elongation to the span of the specimen when it breaks occurs.

3.7 Dry fracture load air-driedbreakingload In the dry state, the sample by the external force to break the maximum load can withstand.

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