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

GB/T 47878-2026

**Fine ceramics - Determination of distribution of tensile strength
and tensile strain to failure of ceramic filaments within a
multifilament tow at ambient temperature**

精细陶瓷 陶瓷纤维束丝中单丝室温拉伸强度和断裂应变分布的测定

(English Translation)

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Table of Contents

Preface	
1 Scope	
2 Normative References	
3 Terms and Definitions	
4 Principle	
5 Significance and Application	
6 Instruments and Equipment	
6.1 Tensile testing machine	
6.2 Data Recording System	
7 Samples	
7.2 Window-type sample	
7.3 Cylindrical end sample	
8 Sample Preparation	
8.1 General Rules	
8.2 Window Sample Preparation	
8.3 Preparation of Cylindrical End Samples	
8.4 Sample Quantity	
9 Experimental Procedures	
9.1 Determination of Initial Cross-sectional Area	
9.2 Gauge Length Determination	
9.3 Sample clamping	
9.4 Selection of Strain Rate	
9.5 Tensile Test	
9.6 Determination of the compliance of the loading system	
9.7 Test Validity	
10 Result Calculation	
10.1 Calculation of the compliance C1 of the loaded system	
10.2 Calculation of the single filament breakage probability P_j	
10.3 Strain distribution at fracture of a single filament	
11 Test Report	
Appendix A (Informative) Comparison of this document with the structural numbering of ISO 22459:2024	

Appendix B (Informative) Technical Differences between this Document and ISO 22459:2024 and Their Reasons

Appendix C (Normative) Method for Determining the Linear Density of Ceramic Fiber Bundles

C.1 Overview

C.2 Instruments and Equipment

C.3 Sample quantity

C.4 Test Step

C.5 Calculation of linear density

Appendix D (Informative) G Function Retrieval Value

Reference

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 is modified to adopt ISO 22459:2024 "Fine ceramics (advanced ceramics, advanced technical ceramics) - Ceramic matrix composite reinforcement".

Determination of room temperature tensile strength and fracture strain distribution of monofilaments in fiber bundles.

Compared with ISO 22459:2024, this document has undergone many structural adjustments. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix A for the table of contents.

This document differs significantly from ISO 22459:2024. The relevant clauses are indicated in vertical margins.

The following editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Room Temperature Tensile Strength and Fracture Stability of Monofilaments in Fine Ceramic Fiber Bundles".

Determination of Variable Distribution;

---The note for terminology 3.1 in ISO 22459:2024 has been deleted;

---The indexing descriptions for Figures 2 and 4, and the index number for Figure 6 have

been revised;

---Appendix A (informative) "Comparison of Structure Numbers in this Document with ISO 22459:2024" has been added;

---Added Appendix B (Informative) "Technical Differences between this Document and ISO 22459:2024 and the Reasons Therefor".

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 Industrial Ceramics (SAC/TC194).

1 Scope

This document describes tensile tests performed at room temperature on ceramic fiber bundles to determine the tensile strength distribution and single-filament breakage of the fiber bundles.

Test methods for crack strain distribution, statistical average tensile strength of single filaments, and Weibull modulus of single filaments.

This document applies to fiber bundles in which the individual filaments can bear load freely and independently during loading, and exhibit linear elastic behavior before breakage.

Continued determination of ceramic fiber bundles. The results obtained by this method differ from those obtained by measuring the tensile strength of resin-impregnated fiber bundles according to ISO 24046.

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 16825.1 Inspection and calibration of static uniaxial testing machines for metallic materials - Part 1: Tensile and/or compressive testing machines Inspection and calibration of force measurement systems (GB/T 16825.1-2022, ISO 7500-1:2018, IDT) GB/T 30019 Determination of carbon fiber density (GB/T 30019-2013, ISO 10119:2002, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.

gauge length

The initial distance between two reference points on the fiber bundle.

Note: The gauge length is usually determined based on the distance between the clamping ends of the fiber bundle.

initial cross-section area S_0 Cross-sectional area of the fiber bundle before the experiment.

towelongation

ΔL

The increase in gauge length during a tensile test.

Total compliance

The ratio of beam displacement to corresponding force measured in a tensile test.