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

GB/T 46065-2025

**Continuous fiber reinforced ceramic matrix composite - Test
method for axial tensile properties of tubes at room
temperature**

(English Translation)

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References

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 20323:2018 "Fine ceramics (advanced ceramics, advanced technical ceramics) - Ceramic matrix composites - Room temperature and humidity control".

Determination of compressive mechanical properties and tensile properties of pipes.

Compared with ISO 20323:2018, this document has undergone many structural adjustments. A table comparing the changes in structural numbering between the two documents is provided.

See Appendix A.

This document differs significantly from ISO 20323:2018. The relevant clauses are indicated in vertical margins.

Single lines (-) are indicated. These technical differences and their reasons are explained in Appendix B.

The following editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Room Temperature Axial Tensile Properties of Continuous Fiber Reinforced Ceramic Matrix Composite Pipes".

Test Methods;

---ISO 7500-1 has been replaced with the normatively referenced GB/T 16825.1 (see 5.1);

---Notes in Chapter 1, 3.17, and 6.3 of ISO 20323:2018 have been deleted;

---Notes 1 and 2 in Chapter 4 of ISO 20323:2018 have been deleted;

---Notes in sections 5.4.3.2, 5.4.3.3, 6.14, 7.3.1, 7.3.6, and 8.2 of ISO 20323:2018 have

been removed;

---All headings in Chapter 9 of ISO 20323:2018 have been removed, and test reports are presented in list format;

---Appendix A (informative) "Comparison of Structure Numbers in this Document with ISO 20323:2018" has been added;

---Added Appendix B (Informative) "Technical Differences between this Document and ISO 20323:2018 and Their Reasons".

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 Industrial Ceramics (SAC/TC194).

1 Scope

This document describes a test method for the room temperature axial tensile properties of continuous fiber-reinforced ceramic matrix composite tubes. (The text then abruptly shifts to a seemingly unrelated topic. composite tubes...) the fiber structure and sample geometry differ from those of flat plate materials; therefore, this method is only applicable to the axial tensile properties of composite tubular samples.

Measurement.

This document describes the axial tensile properties (e.g., tensile strength, maximum tensile strain, elasticity) of continuous fiber reinforced ceramic matrix composite tubing.

Test methods for modulus and Poisson's ratio.

This document applies to the axial tensile properties of unidirectional, bidirectional, or multidirectional continuous fiber reinforced ceramic and glass matrix composite tubing.

Measurement.

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 1216 Outside Micrometer GB/T 12160 Calibration of extensometer systems for

uniaxial testing of metallic materials (GB/T 12160-2019, ISO 9513:2012) IDT) GB/T 16825.1 Inspection and calibration of static uniaxial testing machines for metallic materials - Part 1: Tensile and/or compressive tests Inspection and calibration of mechanical force measurement systems (GB/T 16825.1-2022, ISO 7500-1:2018, IDT) GB/T 17991 Terminology for Fine Ceramics (GB/T 17991-2009, ISO 20507:2003, MOD) GB/T 21389 Vernier, dial indicator and digital calipers GB/T 22093 Electronic Digital Micrometer GB/T 34104 Inspection of Coaxiality under Loading in Testing Machines for Metallic Materials

3 Terms and Definitions

The terms and definitions defined in GB/T 17991 and the following terms and definitions apply to this document.

calibrated length

The length of the sample with a uniform, minimum cross-sectional area.

gauge length

The initial distance between reference points within the calibration length.