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

GB/T 44540-2024

**Fine ceramics - Test method for determining elastic modulus
and bending strength of ceramic tube and rings - Split ring
method**

精细陶瓷 陶瓷管材或环材弹性模量和弯曲强度的测定 缺口环法

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document is modified to adopt ISO 18558:2015 "Fine ceramics (advanced ceramics, advanced technical ceramics) Ceramic tubes or rings Elastic modulus Determination of mass and flexural strength.

The technical differences between this document and ISO 18558:2015 and their reasons are as follows.

-- ISO 7500-1 (see 5.1) was replaced with the normative reference GB/T 16825.1 to adapt to my country's technical conditions and increase operability.

Sexuality;

-- Added the normative reference document GB/T 1216 (see 5.3) to standardize the dimensional measurement.

The accuracy was changed to 0.01 mm to adapt to my country's technical conditions and increase operability;

-- Adjusted the technical content of Section 6.1, deleted the section that the notch width should be 2 mm to 3 mm during the force loading process, and simplified to ensure that the whole process is not closed and the applicability is enhanced, the sample size is measured and the average value is calculated, and the specific number of measurements is given for easy operation;

--The contents of 6.2.1 have been integrated. ISO 18558:2015 divides preparation into two situations, and the descriptions of the two are repeated.

Simplifying and summarizing it makes it more suitable for domestic application.

The following editorial changes were made to this document.

--To coordinate with the existing standards, the name of the standard is changed to "Test Method for Elastic Modulus and Bending Strength of Fine Ceramic Tubes or Rings" Fixed Gap Ring Method.

1 Scope

This document describes a test method for determining the modulus of elasticity and strength of ceramic tubular or annular materials by the notched ring method at room temperature and describes the specimen preparation method, loading mode, loading rate, data collection and reporting format are described.

This document is applicable to homogeneous ceramic, glass, whisker or particle reinforced ceramic composites. This test method can be used to study material properties, Quality control, performance characterization and data acquisition.

This document is not applicable to continuous fiber reinforced ceramic composites.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 1216 Outside Micrometer GB/T 16825.1 Inspection and calibration of static uniaxial testing machines for metallic materials Part 1: Tension and/or compression tests Inspection and calibration of force measurement systems for machines (GB/T 16825.1-2022, ISO 7500-1:2018, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

Elastic modulus

The ratio of stress to strain within the elastic range.

NOTE: The modulus of elasticity is also called Young's modulus.

Bending strength

The maximum stress to which a specimen is subjected when it breaks under load.

Split ring

A ring specimen with one opening is prepared by cutting a notch in the ring specimen.

Note: The schematic diagram of the notched ring specimen is shown in Figure 1.