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

GB/T 46584-2025

**Fine ceramics interface - Test method for tensile and shear
fatigue properties at room temperature under constant
amplitude - Crossed method**

精细陶瓷界面 恒定振幅下室温拉伸和剪切疲劳性能试验方法 十字交叉法
(English Translation)

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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.

This document is modified to adopt ISO 20407:2017 "Fine ceramics (advanced ceramics, advanced technical ceramics) under constant amplitude conditions at room temperature".

Test methods for tensile and shear fatigue properties of ceramic bond interfaces.

This document has undergone significant structural adjustments compared to ISO 20407:2017. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix A for the table.

This document differs significantly from ISO 20407:2017. The relevant clauses are indicated in vertical margins.

Single lines (|) are indicated. A summary of these technical differences and their causes can be found 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 "Test for Room Temperature Tensile and Shear Fatigue Properties of Fine Ceramics Interfaces under Constant Amplitude".

The cross-multiplication method for testing;

---Added sub-topics for Figures 4 and 5.

---Add "Width should not exceed 1mm" (see 7.4).

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 the measurement of tensile/tensile or shear stresses at ceramic-ceramic, ceramic-metal, and ceramic-glass bonding interfaces under constant amplitude conditions at room temperature.

Methods for assessing shear/shear cyclic fatigue performance.

This document applies to interfaces where ceramic materials are bonded to other interfaces through physical or chemical means. The test method is applicable to materials...

Materials research, quality control, performance characterization, and design data acquisition, etc.

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 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 31541 Test method for tensile and shear bond strength of fine ceramic interfaces - Cross-shaped cross method (GB/T 31541-2015, ISO 13124:2011, IDT)

3 Terms and Definitions

The following terms and definitions apply to this document.

cross-bonded testpiece A sample consisting of two rectangular or square strips of the same size and shape, bonded together in a cross shape.

[Source: GB/T 31541-2015, 3.2] 3.2 Average applied stress σ_m the average of the maximum and minimum stresses applied during cyclic fatigue.

number of cycles

The number of times a load is periodically applied to the sample.

Cyclic fatigue life

The total number of load cycles corresponding to the failure of the sample.