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

GB/T 46778-2025

**Fine ceramics - Determination of compressive strength of
ceramic granules**

精细陶瓷 陶瓷造粒粉压缩强度试验方法

(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 18591:2015 "Fine ceramics (advanced ceramics, advanced technical ceramics) - Compressive strength of granulated ceramic powder".

Test methods.

This document has undergone significant structural adjustments compared to ISO 18591:2015. A table comparing the structural numbering changes between the two documents is provided.

See Appendix A.

The technical differences between this document and ISO 18591:2015, and the reasons therefor, are as follows.

---The normative reference GB/T 17991 (see Chapter 3) has been added to adapt to my country's technical conditions and facilitate the implementation of this document;

---The phrase "using a floating structure or spring-suspended structure" (ISO 18591:2015 5.1) has been removed to adapt to my country's technological requirements.

condition;

---Change "A chamfer of 5mm height should be set at one end of the mold sleeve" in ISO 18591:2015 to "A chamfer of 5mm height should be set at both ends of the mold sleeve".

A 5mm chamfer (see 6.1, 5.1 in ISO 18591:2015) is more in line with reality;

---ISO 7500-1 (see 6.2) has been replaced with the normatively referenced GB/T 16825.1, which better adapts to my country's technical conditions and facilitates [further

development].

Execution of this file;

---The normative reference GB/T 1216 (see 6.4) has been added, clarifying the requirements for measuring instruments;

---ISO/IEC 17025 has been replaced with the normatively referenced GB/T 27025 (see Chapter 10) to better suit my country's technical requirements.

This document is designed to facilitate its execution.

The following editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Test Method for Compressive Strength of Fine Ceramic Granulated Powder";

---Added "Note. The equipment beam displacement deviation is large. Use an extensometer to measure the displacement whenever possible to ensure data accuracy" (see...) 6.2);

---Change "accuracy $\pm 0.001\text{g}$ " to "accuracy 0.001g " (see 6.3, 5.3 in ISO 18591:2015);

---The curly braces in the denominators of the formulas have been removed (see 9.1, 8.1 in ISO 18591:2015), which is more in line with Chinese conventions.

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 determining the compressive strength of fine ceramic granulated powder by applying a uniaxial compressive load in a closed mold at room temperature.

This document applies to ceramic granulation powder.

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: Measurement of tensile and/or compressive stresses by these machines Inspection and calibration of force systems (GB/T 16825.1-2022, ISO 7500-1:2018, IDT) GB/T 17991 Terminology for Fine Ceramics GB/T 27025 General requirements for the competence of testing and calibration laboratories (GB/T 27025-2019, ISO/IEC 17025:2017) IDT)

3 Terms and Definitions

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

4 Principles

Dry-pressed ceramic green bodies are formed by pressing ceramic granulation powder. The ceramic granulation powder is formed in a closed mold under unidirectional pressure.

During the pressing process, particle rearrangement first occurs. When the applied pressure exceeds the critical pressure, the granulated powder will deform and break.

The final density of the unpressed green body depends on the compressive strength (critical pressure) of the ceramic granulation powder. The ceramic granules are pressed in a mold using a testing machine.

By measuring the size and density of the powder compact after demolding, load-displacement (or load-strain) curves can be obtained.

The curve is converted into a stress-density curve, and the compressive strength can be determined by the change in the slope of the stress-density curve.

5 Symbols and Markings

The symbols in Table 1 apply to this document.

Table 1 Symbols

Symbolic physical quantity units A. Green body area (cm²) h Green height (cm)