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

GB/T 45875-2025

**Fine ceramics - Determination of densification properties of
ceramic powders on natural sintering**

精细陶瓷 自然烧结条件下陶瓷粉体致密性的测定

(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.

This document is equivalent to ISO 21821:2019 "Fine ceramics (advanced ceramics, advanced technical ceramics) - Ceramic powders under natural sintering conditions" Determination of body density.

The following minimal editorial changes have been made to this document.

--- To coordinate with the existing standard, the name of the standard is changed to "Determination of density of ceramic powders under natural sintering conditions of fine ceramics";

--- Added a note to explain "1 bar" (see Chapter 1).

1 Scope

This document describes the testing of the properties of granulated or non-granulated ceramics during high temperature sintering without applied pressure or external densification.

Test method for the degree of densification of ceramic powder compacts (made from ceramic powder).

This document applies to pure oxides, oxide mixtures and solid solutions, and also to products that can be sintered by vacuum or constant gas pressure (1 bar) and below) to prevent oxidation or decomposition of non-oxide materials (such as carbides, nitrides). This document does not apply to materials that are only hot pressed Ceramics sintered by pressure-assisted sintering techniques such as hot isostatic pressing (HIP), gas pressure sintering (GPS) or spark plasma sintering (SPS)

Materials. If inorganic sintering additives are used, please indicate this in the report.

Note: 1 bar = 100 kPa.

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.

ISO 3611 Geometrical product specifications (GPS) Dimensional measuring equipment. Design and metrological characteristics of outside dimension micrometers

Note: GB/T 27025-2019 General requirements for the competence of testing and calibration laboratories (ISO /IEC 17025:2017, IDT)

ISO 17172 Fine ceramics (advanced ceramics, advanced technical ceramics) Determination of compaction properties of ceramic powders [Fineceramics (advanced ceramics, advanced technical ceramics) powders]

3 Terms and Definitions

There are no terms or definitions that require definition in this document.

4 Principles

During the high temperature heat treatment process, ceramic powder compacts will shrink and densify due to sintering.

The changes in mass, size (diameter and height), volume and apparent density before and after heat treatment can be observed.

The amount, size, volume and apparent density of the pressed green body are determined by the maximum sintering temperature, holding time, heating rate and the apparent density of the green body after compaction.

For example, the change in relative density can be plotted as a function of sintering temperature at each forming pressure. Number curve.