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

GB/T 44541-2024

**Fine ceramics - Ceramic matrix composites - Notations and
symbols**

精细陶瓷 陶瓷基复合材料 符号与标记

(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 19634:2017 "Fine ceramics (advanced ceramics, advanced technical ceramics) Ceramic composite materials symbols and mark".

The following minimal editorial changes were made to this document.

--- To coordinate with the existing standards, the name of the standard is changed to "Symbols and Markings for Fine Ceramic Ceramic Matrix Composite Materials".

1 Scope

This document defines the symbols for the physics, forces, and heat involved in describing ceramic matrix composites and the determination of the properties of ceramic matrix composites.

Symbols used for material properties are intended to avoid confusion when reporting measurement results and product characteristics.

Wherever possible, definitions are aligned with relevant parts of ISO 80000. In addition, this document defines the methods used to measure these characteristics.

symbol.

2 Normative references

The contents of the following documents constitute 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 80000-4 Quantities and units-Part 4: Mechanics ISO 80000-5 Quantities and units-Part 5: Thermodynamics

3 Terms and definitions

For the purpose of this document, the terms and definitions defined in ISO 80000-4 and ISO 80000-5 and the following apply.

The composite material is made of fine ceramic as the matrix and second phase particles, whiskers, fibers, etc. as the reinforcement through appropriate composite process.

Material.

NOTE Composite materials with continuous reinforcement constitute a special class of these materials. Continuously reinforced ceramic matrix composites are divided into several subclasses.

Nomenclature

The notation F/I/M is usually applied to ceramic matrix composites.

---F represents the chemical properties of the fiber reinforcement phase. C represents carbon, SiC represents silicon carbide, Al₂O₃ represents aluminum oxide, etc.;

---I represents the chemical nature of the fiber/matrix interphase. C represents carbon, BN represents boron nitride, LaPO₄ represents lanthanum phosphate, etc.;

---M represents the chemical nature of the matrix. C represents carbon, SiC represents silicon carbide, and Al₂O₃ represents aluminum oxide.

Example 1.A ceramic matrix composite material consisting of silicon carbide fibers, a carbon interfacial phase and silicon carbide. The carbide matrix is represented by SiC/C/SiC.

NOTE More complex symbols can be used to describe components with greater precision.

Example 2.For a composite material composed of carbon fibers, a multilayer interfacial phase silicon carbide matrix consisting of 4 alternating layers, the symbol is.

Cf/[C/SiC]₄/SiC_m.

One-dimensional materials Ceramic matrix composite material with unidirectionally distributed reinforcement phase (3.1).

Note: See Figure 1.