International Standard

ISO 19628

# Fine ceramics (advanced ceramics, advanced technical ceramics) — Thermophysical properties of ceramic composites — Determination of specific heat capacity

*Céramiques techniques — Propriétés thermophysiques des composites céramiques — Détermination de la capacité thermique massique*

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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 206, *Fine ceramics,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 184, *Advanced technical ceramics,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 19268:2017), which has been technically revised.

The main changes are as follows:

— revised scope to extend the maximum temperature of use of Method A to 3 000 K;

— revised Clause 4 by introducing the possibility to apply the drop calorimetry method for temperatures T1 > T2 (conventional drop calorimetry);

— relevant specifications added concerning the containers and thermometers to be used;

— description of in-situ calibration methods of the calorimeter and thermometers;

— addition of a paragraph dealing with the determination of specific heat capacity at given temperatures from measurements performed by drop calorimetry;

— updated list of references in the Bibliography.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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# Fine ceramics (advanced ceramics, advanced technical ceramics) — Thermophysical properties of ceramic composites — Determination of specific heat capacity

## 1 Scope

This document specifies two methods for the determination of the specific heat capacity of ceramic matrix composites with continuous reinforcements (1D, 2D, 3D).

Unidirectional (1D), bi-directional (2D) and tridirectional ($X$D, with $2 < X \leq 3$).

The two methods are:

— method A: drop calorimetry;

— method B: differential scanning calorimetry.

The two methods are applicable from ambient temperature up to a maximum temperature that is method dependent: method A can be used up to 3 000 K, while method B is limited to 1 900 K.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19634, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Ceramic composites — Notations and symbols*

IEC 60584-1, *Thermocouples — Part 1: EMF specifications and tolerances*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19634 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

**3.1**
**specific heat capacity**
$C_p$
amount of heat required to raise the temperature of a mass unit of material by 1 K at constant temperature and pressure

$$C_p = \frac{1}{m}\frac{dQ}{dT} \tag{1}$$

where $Q$ is the heat required for a test-piece of mass $m$.

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