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**Fine ceramics (advanced ceramics,  
advanced technical ceramics) —  
Test method for total electrical  
conductivity of conductive fine  
ceramics**

*Céramiques techniques — Méthode d'essai pour la conductivité  
électrique totale des céramiques techniques conductrices*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 documents 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

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](http://www.iso.org/members.html).

# Fine ceramics (advanced ceramics, advanced technical ceramics) — Test method for total electrical conductivity of conductive fine ceramics

## 1 Scope

This document specifies the test method for the determination of total electrical conductivity of conductive fine ceramics by the DC (direct current) four-terminal method. The test method applies to conductive fine ceramics which have an ionic transference number of 0,01 or less. The applicable conductivity range is from  $1 \text{ S cm}^{-1}$  to  $1\,000 \text{ S cm}^{-1}$  and the temperature range is up to  $1\,000 \text{ °C}$ . The values expressed in the test method are in accordance with the International System of Units (SI).

This document is intended for industrial product quality control and material development of conductive fine ceramics used in electrodes, e.g. fuel cells, batteries and water electrolysis.

## 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 3611, *Geometrical product specifications (GPS) — Dimensional measuring equipment: Micrometers for external measurements — Design and metrological characteristics*

ISO 6145-7, *Gas analysis — Preparation of calibration gas mixtures using dynamic methods — Part 7: Thermal mass-flow controllers*

ISO 13385-1, *Geometrical product specifications (GPS) — Dimensional measuring equipment — Part 1: Design and metrological characteristics of callipers*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 18754, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Determination of density and apparent porosity*

ISO 80000-1, *Quantities and units — Part 1: General*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **total electrical conductivity**

electrical conduction where both electrons and ions carry the electrical charges

### 3.2

#### **electronic conduction**

electrical conduction where electrons (or holes) carry the electrical charges