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

*Céramiques techniques — Détermination de la masse volumique et de  
la porosité apparente*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 18754 was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

This second edition cancels and replaces the first edition (ISO 18754:2003), which has been technically revised.

# Fine ceramics (advanced ceramics, advanced technical ceramics) — Determination of density and apparent porosity

## 1 Scope

This International Standard specifies methods for the determination of the apparent solid density, bulk density, apparent density and geometric bulk density of fine ceramics.

NOTE These methods are not appropriate for the determination of an apparent porosity greater than 10 %. For materials with higher porosity, the accuracy of the measurement may not be satisfactory. The method may also not give a satisfactory open porosity result if it is less than 0,5 %

## 2 Normative references

The following referenced documents are indispensable for the application 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 386:1977, *Liquid-in-glass laboratory thermometers — Principles of design, construction and use*

ISO 758:1976, *Liquid chemical products for industrial use — Determination of density at 20 degrees C*

ISO 13385-1:2011, *Geometrical product specifications (GPS) — Dimensional measuring equipment — Part 1: Callipers; Design and metrological characteristics*

EN 1006:2009, *Advanced technical ceramics — Monolithic ceramics — Guidance on the selection of test pieces for the evaluation of properties*

ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

## 3 Terms and definitions

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

### 3.1

#### **open pores**

pores that are penetrated by an immersion liquid, or that are connected to the atmosphere, either directly or via one another

### 3.2

#### **closed pores**

pores that are not penetrated by the immersion liquid, or that are not connected to the atmosphere

### 3.3

#### **bulk volume**

the sum of the respective volumes of the solid material, the open pores and the closed pores

### 3.4

#### **apparent solid volume**

the sum of the respective volumes of the solid material and the closed pores

### 3.5

#### **apparent solid density**

the ratio of the mass of the dry material to its apparent solid volume