Fine ceramics (advanced ceramics, advanced technical ceramics) - Determination of specific surface area of ceramic powders by gas adsorption using the BET method

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 18757:2005 sisaldab Euroopa standardi EN ISO 18757:2005 ingliskeelset teksti. Käesolev dokument on jõustatud 28.12.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 18757:2005 consists of the English text of the European standard EN ISO 18757:2005. This document is endorsed on 28.12.2005 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Standard määrab kindlaks meetodi spetsiaalse tehnilise keraamika toormena kasutatavate pulbrite absoluutse tiheduse määramiseks vedelikpüknomeetria meetodil.	**Scope:** This International Standard provides guidelines for the determination of the total specific external and internal surface area of disperse or porous (pore diameter) fine ceramic materials by measuring the amount of physically adsorbed gas according to the method of Brunauer, Emmet and Teller (BET method) [1].

ICS 81.060.10

Võtmesõnad: katsed, keraamika, määramine, pulbermaterjalid, püknomeetriline analüüs, tihedus

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 18757

October 2005

ICS 81.060.30

Supersedes EN 725-6:1996

English Version

Fine ceramics (advanced ceramics, advanced technical ceramics) - Determination of specific surface area of ceramic powders by gas adsorption using the BET method (ISO 18757:2003)

Poudres céramiques - Détermination de l'aire massique (surface spécifique) par adsorption de gaz à l'aide de la méthode BET (ISO 18757:2003)

Hochleistungskeramik - Bestimmung der spezifischen Oberfläche keramischer Pulver durch Gasadsorption nach dem BET-Verfahren (ISO 18757:2003)

This European Standard was approved by CEN on 19 September 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN ISO 18757:2005: E

Foreword

The text of ISO 18757:2003 has been prepared by Technical Committee ISO/TC 206 “Fine ceramics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 18757:2005 by Technical Committee CEN/TC 184 “Advanced technical ceramics” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

This document supersedes EN 725-6:1996.

CEN/TC 184 has prepared EN 725 Advanced technical ceramics — Methods of test for ceramic powders in twelve parts as follows:

Part 1: *Determination of impurities in alumina*

Part 2: *Determination of impurities in barium titanate*

Part 3: *Determination of oxygen content of non-oxides by thermal extraction*

Part 4: *Determination of oxygen content of non-oxides by XRF analysis*

Part 5: *Determination of particle size distribution*

Part 6: *Determination of specific surface area*

Part 7: *Determination of absolute density*

Part 8: *Determination of tapped density*

Part 9: *Determination of untamped bulk density*

Part 10: *Determination of compaction properties*

Part 11: *Determination of the densification on natural sintering*

Part 12: *Chemical analysis of zirconia*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 18757:2003 has been approved by CEN as EN ISO 18757:2005 without any modifications.

INTERNATIONAL STANDARD

ISO 18757

First edition
2003-12-01

Fine ceramics (advanced ceramics, advanced technical ceramics) — Determination of specific surface area of ceramic powders by gas adsorption using the BET method

Poudres céramiques — Détermination de l'aire massique (surface spécifique) par adsorption de gaz à l'aide de la méthode BET

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Contents

Page

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 18757 was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

Fine ceramics (advanced ceramics, advanced technical ceramics) — Determination of specific surface area of ceramic powders by gas adsorption using the BET method

1 Scope

This International Standard provides guidelines for the determination of the total specific external and internal surface area of disperse or porous (pore diameter $>$ 2 nm) fine ceramic materials by measuring the amount of physically adsorbed gas according to the method of Brunauer, Emmet and Teller (BET method) [1]. General guidelines of the method are described in ISO 9277. This International Standard only focuses on specific details relevant to fine ceramic materials. It should further be noted that the BET method cannot be applied to type I isotherms (microporous materials or chemisorption behaviour) or when the solid absorbs the measuring gas.

NOTE For further details on those subjects please see IUPAC references [2], [3] or the textbook by Gregg and Sing [4].

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 9277:1995, *Determination of the specific surface area of solids by gas adsorption using the BET method*

3 Terms and definitions

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

3.1
adsorption
enrichment of the adsorbate at the external and accessible internal surfaces of a solid

3.2
physisorption
weak bonding of the adsorbate, reversible by small changes in pressure or temperature

3.3
adsorbate
measuring gas to be adsorbed

3.4
adsorbent
solid, which adsorbs the measuring gas

3.5
surface area
area of external surface of a fine ceramic powder plus the internal surface of its accessible macro- and mesopores