Spetsiaalne tehniline keraamika. Keraamiliste pulbermaterjalide katsemeetodid. Osa 6: Eripinna suuruse määramine

Advanced technical ceramics - Methods of test for ceramic powders - Part 6: Determination of the specific surface area

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 725-6:2000 sisaldab Euroopa standardi EN 725-6:1996 ingliskeelset teksti.	This Estonian standard EVS-EN 725-6:2000 consists of the English text of the European standard EN 725-6:1996.
Standard on kinnitatud Eesti Standardikeskuse 11.01.2000 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 11.01.2000 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

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absorptsioon, katsed, keraamika, lämmastik, määramine, pulbermaterjalid, spetsiifiline piirkond

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EN 725-6

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Descriptors: Ceramics, powder, testing, specific surface area.

English version

Advanced technical ceramics

Methods of test for ceramic powders

Part 6: Determination of the specific surface area

Céramiques techniques avancées; méthodes d'essai pour poudres céramiques. Partie 6: Détermination de la surface spécifique

Hochleistungskeramik; Prüfverfahren für keramische Pulver. Teil 6: Bestimmung der spezifischen Oberfläche

This European Standard was approved by CEN on 1995-11-02.

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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Contents

Foreword

This European Standard has been prepared by CEN/TC 184 "Advanced technical ceramics", of which the secretariat is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical standard or by endorsement, at the latest by July 1996, and conflicting national standards shall be withdrawn at the latest by July 1996.

The method given is closely based on ISO 8008:1987 "Aluminium oxide primarily used for the production of aluminium - Determination of specific surface area by nitrogen absorption (single point method)", published by the International Organization for Standardization (ISO).

EN 725 'Advanced technical ceramics - Methods of test for ceramic powders' consists of eleven parts:

Part 1 :	Determination of impurities in alumina
Part 2 :	Determination of impurities in barium titanate (ENV)
Part 3 :	Determination of oxygen content of non-oxides by thermal extraction
Part 4 :	Determination of oxygen content of non-oxides by XRF analysis (ENV)
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 (ENV)

In accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK.

1 Scope

This Part of EN 725 specifies a method for the determination of the specific surface area of powders used for technical ceramics, by a nitrogen adsorption, single-point method.

The method is limited to the measurement of surface areas of over 1 m^2/g.

2 Principle

The method is based on the property of the solids to adsorb gas molecules at their surface.

In the range from 0,05 to 0,3 times the saturation vapour pressure of the measuring gas, the multilayer absorption begins. The formation of the first monolayer of adsorbed molecules can be detected from the behaviour of the adsorption isotherm in this range; this is the only process relevant to the present method.

Nitrogen is introduced at ambient temperature and at atmospheric pressure into two bottles of equal volume, one of which contains the test portion while the other is empty. The connected bottles are immersed in a refrigerant bath of liquid nitrogen. Since some nitrogen is adsorbed by the sample, a differential pressure occurs between the two bottles and is measured by means of a differential manometer. From this difference, the number of molecules adsorbed on the surface is calculated.

This number is multiplied by the known area occupied by a single adsorbed molecule so that the total surface area is obtained. The area occupied by an adsorbed nitrogen molecule is taken as $16,2 \times 10^{-20}$ m^2.

3 Apparatus

3.1 Adsorption apparatus (see figure 1)

The apparatus consists of a reference bottle (7) and a sample adsorption bottle (8) which are moved on to the two connecting pieces, with sealing rings in between to make the joint gas-tight. At each connecting piece, there is a valve (1 and 2), by which the bottles can be connected to the atmosphere. The measuring gas is admitted to the bottle through the capillaries inside the connecting pieces.

The bottles, made of shock-resisting glass, have a volume of about 100 cm^3. The difference between the volume of the two bottles shall not exceed 0,1 %. The necks of the bottles consist of calibrated glass tubes with an internal diameter of 9 mm $\pm$ 0,02 mm. Each tube has an upper and lower mark.