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**Sodobna tehnična keramika - Preskusne metode za keramične praške - 10.  
del: Ugotavljanje lastnosti za stiskanje**

Advanced technical ceramics - Methods of test for ceramic powders - Part 10:  
Determination of compaction properties

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July 2005

ICS

Will supersede EN 725-10:1997

English version

## Advanced technical ceramics - Methods of test for ceramic powders - Part 10: Determination of compaction properties

Céramiques techniques avancées - Méthodes d'essai pour  
poudres céramiques - Partie 10 : Détermination des  
propriétés de compaction

Hochleistungskeramik - Prüfverfahren für keramische  
Pulver - Teil 10: Bestimmung der  
Verdichtungseigenschaften

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 184.

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## Foreword

This document (prEN 725-10:2005) has been prepared by Technical Committee CEN/TC 184 "Advanced technical ceramics", the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 725-10:1997.

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 in aluminium nitride 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 densification on natural sintering*
- Part 12: *Chemical analysis of zirconia*

## 1 Scope

This Part of EN 725 describes methods for the determination of the compaction behaviour of ungranulated or granulated ceramic powders, when subjected to uniaxial compressive loading in a rigid die, under specified conditions.

## 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.

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

ISO 3611, *Micrometer callipers for external measurement*

## 3 Principle

The powder is compacted uniaxially in a rigid die by double-action pressing. Samples of the powder may be pressed either at a single specified pressure or at a series of specified pressures. After ejection from the die, the apparent geometrical density of the compact is determined.

The density obtained in the former case represents the compaction properties of the powder at the specified pressure. The densities obtained in the latter case are utilised for drawing the compaction curve of the powder, which is a plot of the density as a function of the compacting pressure.

## 4 Symbols and abbreviations

Table 1

Symbol	Designation	Unit
$\rho_{geom}$	Apparent geometrical density	kg/m <sup>3</sup>
$m$	Mass of the compact	g
$V$	Volume of the compact	cm <sup>3</sup>

If the apparent density is measured at one specified pressure only, for example 200 MPa, the symbol becomes  $\rho_{geom}(200)$ .

## 5 Apparatus

**5.1 Die**, which shall be made from hard material (e.g. tungsten carbide). The cylindrical die shall contain two punches for producing cylindrical compacts and shall be of the floating type or of the type suspended from a spring. The die shall be capable of making compacts of diameter 20 mm to 26 mm with a height to diameter ratio between 0,3 and 0,5, with tolerances as indicated in figure 1. The upper part of the die shall be (preferably) designed to avoid damage to the compact during the ejection phase due to springback phenomenon. An ejection cone of height : 5 mm, allowing an increase of the diameter at the top of the die of approximately 1 %, as shown in figure 1, should be used.

The die may be fitted with a venting valve.