National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 725-10:2007

ICS 81.060.30

National Standards
Authority of Ireland
Glasnevin, Dublin 9
Ireland
Tel: +353 1 807 3800
Fax: +353 1 807 3838
http://www.nsai.ie

Sales
http://www.standards.ie

ADVANCED TECHNICAL CERAMICS - METHODS OF TEST FOR CERAMIC POWDERS - PART 10: DETERMINATION OF COMPACTION PROPERTIES

This Irish Standard was published under the authority of the National Standards Authority of Ireland and comes into effect on:
12 October 2007

Price Code F

Údarás um Chaighdeáin Náisiúnta na hÉireann

This page is intentionally left BLANK.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 725-10

September 2007

ICS 81.060.30

Supersedes 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 des poudres céramiques - Partie 10: Détermination des propriétés de compaction

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

This European Standard was approved by CEN on 11 August 2007.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, 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 725-10:2007: E

Contents

Page

Foreword

This document (EN 725-10:2007) has been prepared 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 March 2008, and conflicting national standards shall be withdrawn at the latest by March 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 725-10:1996.

EN 725 *Advanced technical ceramics — Methods of test for ceramic powders* was prepared in parts as follows:

Part 1: *Determination of impurities in alumina*

Part 2: *Determination of impurities in barium titanate*

Part 3: *Determination of the oxygen content of non-oxides by thermal extraction with a carrier gas*

Part 4: *Determination of oxygen content in aluminium nitride by XRF analysis*

Part 5: *Determination of particle size distribution*

Part 6: *Determination of the specific surface area* [withdrawn]

Part 7: *Determination of the absolute density* [withdrawn]

Part 8: *Determination of tapped bulk density*

Part 9: *Determination of un-tapped bulk density*

Part 10: *Determination of compaction properties*

Part 11: *Determination of densification on natural sintering*

Part 12: *Chemical analysis of zirconia*

Parts 6 and 7 of the series were superseded in 2005 by EN ISO 18757 and EN ISO 18753 respectively.

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

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/IEC 17025:2005)*

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 pressure or at a series of pressures. After ejection from the die, the apparent geometrical density of the compact is determined.

Where one pressure is used, the density obtained represents the compaction properties of the powder at that pressure. Where more than one pressure is used, the densities obtained are utilized for drawing the compaction curve of the powder, which is a plot of its density as a function of the compacting pressure.

4 Symbols

The symbols and associated units used in this part of EN 725 are set out in Table 1.

Table 1 — Symbols and units

Symbol	Designation	Unit
ρ_{geom}	Apparent geometrical density	kg/m^3
m	Mass of the compact	g
V	Volume of the compact	cm^3

If the apparent density is measured at one pressure only, for example 200 MPa, the symbol becomes, e.g. ρ_{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. 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.