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IRISH STANDARD

I.S. EN 725-3:2007

ICS 81.060.30

ADVANCED TECHNICAL CERAMICS - METHODS OF TEST FOR CERAMIC POWDERS - PART 3: DETERMINATION OF THE OXYGEN CONTENT OF NONOXIDES BY THERMAL EXTRACTION WITH A CARRIER GAS

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Advanced technical ceramics - Methods of test for ceramic powders - Part 3: Determination of the oxygen content of non-oxides by thermal extraction with a carrier gas

Céramiques techniques avancées - Méthodes d'essais pour poudres céramiques - Partie 3: Détermination de la teneur en oxygène de poudres non-oxydes par extraction à chaud sous gaz porteur

Hochleistungskeramik - Prüfverfahren für keramische Pulver - Teil 3: Bestimmung des Sauerstoffgehaltes in Nichtoxid-Pulvern mittels Trägergasheißextraktion

This European Standard was approved by CEN on 2 December 2006.

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Foreword

This document (EN 725-3:2007) 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of an identical text or by endorsement, at the latest by July 2007, and conflicting national standards shall be withdrawn at the latest by July 2007.

This document supersedes EN 725-3:1994.

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Part 6: *Determination of the specific surface area* [withdrawn]

Part 7: *Determination of the absolute density* [withdrawn]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Parts 6 and 7 of the series were superseded in 2005 by EN ISO 18757 and EN ISO 18753 respectively.

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1 Scope

This part of EN 725 describes a method for the determination of the oxygen content of non-oxide powders used for advanced technical ceramics, using an inert carrier gas thermal extraction method. The method described is suitable for oxygen contents of less than 3 %.

NOTE An indication of the limits of determination is usually given by the manufacturers of the gas analysis apparatus used. However, for a specific measurement procedure, such limits can be determined by experiments conducted by the user.

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

A test sample is heated in a graphite crucible at a high temperature in a flow of an inert carrier gas. Oxygen in the sample is converted to oxides of carbon, which are extracted and transformed to consist entirely of either carbon monoxide or carbon dioxide. This volume is then determined by a method of gas analysis.

NOTE Guidance on the selection of test conditions is given in Annex A.

4 Apparatus

4.1 ***Scoop***, for transferring the test sample.

4.2 ***Graphite crucible***, which is used as a carbon source. The crucible is capable of being electrically heated by two electrodes, or by induction.

4.3 ***Tin or nickel capsule (optional)***, to contain the ceramic powder sample.

4.4 ***Nickel wire basket (optional)***, for use as a fluxing agent with certain powders such as aluminium nitride.

4.5 ***Gas analysis apparatus***, based on one of the following techniques:

a) volumetric analysis, for measurement of carbon monoxide gas;

b) chromatography, for carbon monoxide;

c) thermal conductivity, for carbon monoxide and carbon dioxide;

d) coulometric analysis, for carbon dioxide;

e) infrared absorption, for carbon dioxide;

f) gravimetry, by absorption of carbon dioxide.

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