ILNAS-EN 1071-4:2006 - Preview only Copy via ILNAS e-Shop

ILNAS

Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 1071-4:2006

Céramiques techniques avancées - Méthodes d'essais pour revêtements céramiques - Partie 4 : Détermination de la composition chimique avec analyse

02/2006

National Foreword

This European Standard EN 1071-4:2006 was adopted as Luxembourgish Standard ILNAS-EN 1071-4:2006.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html

ILNAS-EN 1071-4:2006 - Preview only Copy via ILNAS e-Shop

THIS PUBLICATION IS COPYRIGHT PROTECTED
Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

ILNAS-EN 1071-4:2006

EUROPEAN STANDARD EN 1071-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2006

ICS 81.060.30

Supersedes ENV 1071-4:1995

English Version

Advanced technical ceramics - Methods of test for ceramic coatings - Part 4: Determination of chemical composition by electron probe microanalysis (EPMA)

Céramiques techniques avancées - Méthodes d'essais pour revêtements céramiques - Partie 4 : Détermination de la composition chimique avec analyse par microsonde électronique (EPMA)

Hochleistungskeramik - Verfahren zur Prüfung keramischer Schichten - Teil 4: Bestimmung der chemischen Zusammensetzung durch Elektronenstrahl-Mikrobereichsanalyse (ESMA)

This European Standard was approved by CEN on 30 December 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

ILNAS-EN 1071-4:2006 - Preview only Copy via ILNAS e-Shop

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

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

© 2006 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 1071-4:2006: E

ILNAS-EN 1071-4:2006

Contents

Page

Foreword 3

1 Scope 5

2 Normative references 5

3 Terms and definitions 5
3.1 General 5
3.2 Terms used in electron probe microanalysis 6

4 Principle 7

5 Apparatus and materials 8
5.1 General 8
5.2 Scanning electron microscope 8
5.3 Electron probe microanalyser 9
5.4 Energy dispersive spectrometer 9
5.5 Wavelength dispersive spectrometer 9

6 Preparation of test piece 9
6.1 General 9
6.2 Surface roughness 9
6.3 Surface conduction 10

7 Test procedure 11
7.1 General 11
7.2 Instrument conditions 11
7.3 Analysis of thin coatings 11
7.4 Analysis of thick coatings 12
7.5 Analysis of multilayer coatings 12

8 Accuracy and interferences 13

9 Test report 13

Bibliography 15

ILNAS-EN 1071-4:2006 - Preview only Copy via ILNAS e-Shop

ILNAS-EN 1071-4:2006 - Preview only Copy via ILNAS e-Shop

Foreword

This European Standard (EN 1071-4:2006) 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 August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

EN 1071 *Advanced technical ceramics – Methods of test for ceramic coatings* consists of 11 Parts:

Part 1: *Determination of coating thickness by contact probe profilometer*

Part 2: *Determination of coating thickness by the crater grinding method*

Part 3: *Determination of adhesion and other mechanical failure modes by a scratch test*

Part 4: *Determination of chemical composition by electron probe microanalysis (EPMA)*

Part 5: *Determination of porosity*

Part 6: *Determination of the abrasion resistance of coatings by a micro-abrasion wear test*

Part 7: *Determination of hardness and Young's modulus by instrumented indentation testing*

Part 8: *Rockwell indentation test for evaluation of adhesion*

Part 9: *Determination of fracture strain*

Part 10: *Determination of coating thickness by cross sectioning*

Part 11: *Determination of internal stress by the Stoney formula*

Parts 7 to 11 are Technical Specifications.

This European Standard supersedes ENV 1071-4:1995.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

ILNAS-EN 1071-4:2006

Introduction

Electron probe microanalysis (EPMA) is a commonly used analytical technique which is applicable to a wide range of materials in bulk form. While international standards for this procedure have been developed under ISO/TC 202 'Microbeam analysis', currently no European or international standard considers the application of EPMA to ceramic coating analysis.

Terms and definitions, including those used in this European Standard that are not specific to this standard are given in ISO 18115 and in ISO 23833.

The composition of a coating is a critical factor determining the performance of a product, so this analytical procedure can be used in quality control, coating development, characterisation and for design data acquisition purposes.

Reference works on electron probe microanalysis are listed in the Bibliography [1, 2].

ILNAS-EN 1071-4:2006 - Preview only Copy via ILNAS e-Shop