National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 820-1:2002

ICS 81.060.30

National Standards
Authority of Ireland
Dublin 9
Ireland

Tel (01) 807 3800
Tel (01) 807 3838

ADVANCED TECHNICAL CERAMICS - METHODS OF TESTING MONOLITHIC CERAMICS - THERMONECHANICAL PROPERTIES - PART 1: DETERMINATION OF FLEXURAL STRENGTH AT ELEVATED TEMPERATURES

This Irish Standard was published under the authority of the National Standards Authority of Ireland and comes into effect on: November 8, 2002

Price Code E

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 820-1

October 2002

ICS 81.060.30

Supersedes ENV 820-1:1993

English version

Advanced technical ceramics - Methods of testing monolithic ceramics - Thermonechanical properties - Part 1: Determination of flexural strength at elevated temperatures

Céramiques techniques avancées - Méthode d'essai des céramiques monolithiques - Propriétés thermodynamiques - Détermination de la résistance à la flexion à températures élevées

Hochleistungskeramik - Monolithische Keramik - Thermomechanische Eigenschaften - Teil 1: Bestimmung der Biegefestigkeit bei erhöhten Temperaturen

This European Standard was approved by CEN on 8 August 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, 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 820-1:2002 E

Contents

Foreword

This document EN 820-1:2002 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 April 2003, and conflicting national standards shall be withdrawn at the latest by April 2003.

This document supersedes ENV 820-1:1993.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

EN 820 *'Advanced technical ceramics – Methods of testing monolithic ceramics – Thermomechanical properties'* consists of three Parts:

— *Part 1 : Determination of flexural strength at elevated temperatures*

— *Part 2 : Determination of self-loaded deformation*

— *Part 3 : Determination resistance to thermal shock by water quenching*

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

1 Scope

This Part of this European Standard specifies a method of determining the three-point or four-point flexural strength of advanced monolithic technical ceramics at elevated temperatures as agreed between parties to the test. The test can be performed in any appropriate atmosphere.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and in the publications listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 843-1, *Advanced technical ceramics – Monolithic ceramics – Mechanical tests at room temperature – Part 1: Determination of flexural strength.*

ENV 843-5, *Advanced technical ceramics – Monolithic ceramics – Mechanical tests at room temperature – Part 5: Statistical analysis of fracture data.*

EN 10002-2, *Metallic materials – Tensile testing – Part 2: Verification of the force measuring system of the tensile testing machine.*

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

IEC 60584, *Thermocouples - Part 1: Reference tables.*

IEC 60584, *Thermocouples - Part 2: Tolerances.*

ISO 3611, *Micrometer callipers for external measurement.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
nominal flexural strength
maximum nominal stress at the instant of failure supported by the material when loaded in elastic bending

NOTE It is recognised that flexural strength tests on ceramics at elevated temperature may reveal inelastic behaviour in the material. Under such conditions, the nominal flexural strength calculated in accordance with this standard is not strictly a valid result, since it tends to overestimate the true surface stress in the test piece. This method requires that the load/displacement relationship for each test piece at each temperature is inspected, and the validity of the result determined.

3.2
three-point flexure
means of bending a beam test piece whereby the test piece is supported on bearings near its ends, and a central load is applied