Spetsiaalne tehniline keraamika. Monoliitkeraamika.Termofüüsikalised omadused. Osa 2: Termilise difusiooni määramine laser- (või pulseeriva soojuse) meetodil

Advanced technical ceramics - Monolithic ceramics - Thermo-physical properties Part 2: Determination of thermal diffusivity by the laser flash (or heat pulse) method

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 821-2:2000 sisaldab Euroopa standardi EN 821-2:1997 ingliskeelset teksti. Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 821-2:2000 consists of the English text of the European standard EN 821-2:1997. This document is endorsed on 11.01.2000 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: See standardi EN 821 osa määrab kindlaks meetodi spetsiaalse tehnilise keraamika monoliitide termilise difusiooni määramiseks täpsusega ligikaudu +/- 5%. See meetod sobib termilise difusiooni määramiseks vahemikus 0,1 1000 mm2/s, temperatuuril üle 180 °C.	**Scope:**

ICS 81.060.30

Võtmesõnad: difusioon, katsed, keraamika, määramine, pulbermaterjalid, soojusjuhtivus, termodünaamilised omadused

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 821-2

June 1997

ICS 81.060.99

Descriptors: Ceramics, thermal diffusivity, testing.

English version

Advanced technical ceramics

Monolithic ceramics – Thermo-physical properties

Part 2: Determination of thermal diffusivity by the laser flash (or heat pulse) method

Céramiques techniques avancées – Céramiques monolithiques – Propriétés thermo-physiques – Partie 2: Détermination de la diffusivité thermique par la méthode Flash laser (ou impulsion de chaleur)

Hochleistungskeramik – Monolithische Keramik – Thermophysikalische Eigenschaften – Teil 2: Messung der Temperaturleitfähigkeit mit dem Laserflash-(oder Wärmepuls-)Verfahren

This European Standard was approved by CEN on 1997-05-24.

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.

The European Standards exist 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, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Contents

Foreword

This European Standard 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 December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

EN 821 consists of three Parts:

Part 1 : Determination of thermal expansion
Part 2 : Determination of thermal diffusivity
Part 3 : Determination of specific heat capacity (ENV)

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Part of EN 821 specifies a method for the determination of thermal diffusivity of advanced monolithic technical ceramics, to an accuracy of approximately $\pm$ 5 %. It is suitable for the measurement of thermal diffusivity values in the range 0,1 mm^2/s to 1000 mm^2/s at temperatures greater than - 180 °C.

Annex A gives the mathematical derivation of the calculations, and Annex B contains instruction on actions necessary when the calculations cannot be made in the usual way.

NOTE 1 : It is not advisable to exceed the temperature at which the test piece was manufactured.

NOTE 2 : This method involves the use of a high powered pulsed laser system or high energy photoflash equipment as well as high vacuum and high temperature furnace capability. Such equipment therefore should be operated within established safety procedures. See EN 60825.

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 the publications are 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

EN 45001	General criteria for the operation of testing laboratories
EN 60584-1	Thermocouples Part 1 : Reference tables
EN 60584-2	Thermocouples Part 2 : Tolerances

3 Definitions

For the purposes of this Part of EN 821, the following definitions apply:

3.1 thermal diffusivity: Thermal conductivity divided by heat capacity per unit volume.

3.2 thermal conductivity: Density of heat flow rate divided by temperature gradient under steady state conditions.

3.3 specific heat: The heat capacity per unit mass.