

Advanced technical ceramics — Ceramic composites — Determination of the thermal diffusivity of ceramic fibres

ICS 81.060.30

National foreword

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This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature. It should be applied on this provisional basis, so that information and experience of its practical application can be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the international organization responsible for its conversion to an international standard. A review of this publication will be initiated not later than 3 years after its publication by the international organization so that a decision can be taken on its status. Notification of the start of the review period will be made in an announcement in the appropriate issue of Update Standards.

According to the replies received by the end of the review period, the responsible BSI Committee will decide whether to support the conversion into an international Standard, to extend the life of the Technical Specification or to withdraw it. Comments should be sent to the Secretary of the responsible BSI Technical Committee at British Standards House, 389 Chiswick High Road, London W4 4AL.

The UK participation in its preparation was entrusted to Technical Committee RPI/13, Advanced technical ceramics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

**Advanced technical ceramics - Ceramic composites -
Determination of the thermal diffusivity of ceramic fibres**

Céramiques techniques avancées - Céramiques
composites - Détermination de la diffusion thermique des
fibres céramiques

Hochleistungskeramik - Keramische Verbundwerkstoffe -
Bestimmung der Temperaturleitfähigkeit von keramischen
Fasern

This Technical Specification (CEN/TS) was approved by CEN on 3 February 2009 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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Foreword

This document (CEN/TS 15866:2009) has been prepared by Technical Committee CEN/TC 184 “Advanced technical ceramics”, the secretariat of which is held by BSI.

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1 Scope

This Technical Specification specifies the conditions for the determination of the thermal diffusivity of single filaments of ceramic fibres parallel to the fibre axis.

This Technical Specification applies to continuous ceramic filaments taken from tows, yarns, braids and knittings.

The experimental conditions are such that the material behaves in a homogeneous manner and that the heat transfer occurs only by thermal conduction.

The method is applicable to materials which are physically and chemically stable during the measurement, and covers the range of temperature between 100 K and 600 K. It is suitable for the measurement of thermal diffusivity values in the range between $10^{-4} \text{ m}^2\cdot\text{s}^{-1}$ and $10^{-7} \text{ m}^2\cdot\text{s}^{-1}$.

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 843-5:2006, *Advanced technical ceramics — Mechanical properties of monolithic ceramics at room temperature — Part 5: Statistical analysis*

CEN/TR 13233:2007, *Advanced technical ceramics — Notations and symbols*

EN 60584-1, *Thermocouples — Part 1: Reference tables (IEC 60584-1:1995)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*

ISO 3611, *Micrometer callipers for external measurement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TR 13233:2007 and the following apply.

3.1 thermal diffusivity

a

ratio of the thermal conductivity to the product of the bulk density and the specific heat capacity

3.2 transient half time

t_{1/2}

time from the initiation of the pulse until the increase of the temperature on the back face of the test specimen reaches one half of the maximum temperature increase

3.3 thickness

h

dimension of the test specimen in the direction of heat transfer measurement