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S.R. CEN/TS 15866:2009

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

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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.

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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

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