

**Advanced technical ceramics - Ceramic composites, thermophysical properties
- Part 3: Determination of specific heat capacity**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1159-3:2003 sisaldab Euroopa standardi EN 1159-3:2003 ingliskeelset teksti. Käesolev dokument on jõustatud 16.05.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 1159-3:2003 consists of the English text of the European standard EN 1159-3:2003. This document is endorsed on 16.05.2003 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.
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Käsitlusala: This part of EN 1159 describes two methods for the determination of the specific heat capacity of ceramic matrix composites with continuous reinforcements (1D, 2D, 3D)	Scope: This part of EN 1159 describes two methods for the determination of the specific heat capacity of ceramic matrix composites with continuous reinforcements (1D, 2D, 3D)
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English version

Advanced technical ceramics - Ceramic composites,
thermophysical properties - Part 3: Determination of specific
heat capacity

Céramiques techniques avancées - Composites
céramiques, propriétés thermophysiques - Partie 3:
Détermination de la capacité thermique spécifique

Hochleistungskeramik - Keramische Verbundwerkstoffe,
thermophysikalische Eigenschaften - Teil 3: Bestimmung
der spezifischen Wärmekapazität

This European Standard was approved by CEN on 2 January 2003.

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CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Contents

	page
Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Method A - Drop calorimetry	5
4.1 Principle	5
4.2 Apparatus	5
4.3 Standard reference materials	5
4.4 Test specimens	5
4.5 Calibration of calorimeter	5
4.5.1 General	5
4.5.2 Electrical Calibration	6
4.5.3 Calibration using standard reference material	6
4.6 Test procedures	6
4.6.1 Test without a crucible	6
4.6.2 Test with a crucible	6
4.6.3 Description of test	7
4.7 Calculations	7
4.7.1 General	7
4.7.2 Determination of the calorimetric calibration factor	8
4.7.3 Determination of mean specific heat capacity $\overline{C_p}$	8
5 Method B - Differential scanning calorimetry	9
5.1 Principle	9
5.1.1 General	9
5.1.2 Stepwise heating method	9
5.1.3 Continuous heating method	9
5.2 Apparatus	10
5.2.1 Differential scanning calorimeter	10
5.3 Standard reference materials, SRM	10
5.4 Test specimens	10
5.5 Temperature calibration	10
5.6 Test procedure for the determination of C_p	11
5.6.1 General	11
5.6.2 Method 1: Measurements requiring the knowledge of the K factor	11
5.6.3 Method 2: Measurements requiring the use of a reference standard material (SRM)	12
5.7 Calculation of results	13
5.7.1 Method requiring the knowledge of the K factor	13
5.7.2 Method using an SRM	14
6 Test report	16
Annex A (normative) Drop calorimetry - Determination of the calibration factor using standard reference material	19
Annex B (informative) Standard reference material	20
Annex C (informative) Materials for calorimeter calibrations	25
Bibliography	26

Foreword

This document (EN 1159-3:2003) 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 October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

This document supersedes ENV 1159-3:1995.

EN 1159 *Advanced technical ceramics – Ceramic composites, thermophysical properties* consists of three parts:

- *Part 1: Determination of thermal expansion*
- *Part 2: Determination of thermal diffusivity*
- *Part 3: Determination of specific heat capacity*

Annex A is normative. Annexes B and C are informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This part of EN 1159 describes two methods for the determination of the specific heat capacity of ceramic matrix composites with continuous reinforcements (1D, 2D, 3D).

Unidirectional (1D), bi-directional (2D) and tridirectional (XD, with $2 < x \leq 3$).

The two methods are:

- method A: drop calorimetry;
- method B: differential scanning calorimetry.

They are applicable from ambient temperature up to a maximum temperature depending on the method: method A may be used up to 2 250 K, while method B is limited to 1 900 K.

NOTE Method A is limited to the determination of an average value of the specific heat capacity over a given temperature range and can give a larger spread of results.

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 (including amendments).

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

ENV 13233:1998, *Advanced technical ceramics – Ceramic composites – Notations and symbols*.

3 Terms and definitions

For the purposes of this European Standard, the following definitions and those given in ENV 13233:1998 apply.

3.1

specific heat capacity, C_p

amount of heat required to raise the temperature of a mass unit of material by 1 K at constant temperature and pressure

$$C_p = \frac{1}{m} \frac{dQ}{dT}$$

where

Q is the heat required for a test-piece of mass m

3.2

mean specific heat capacity, $\overline{C_p}$

amount of heat required to raise the temperature of a mass unit of a material from temperature T_1 to temperature T_2 at a constant pressure, divided by the temperature range $(T_2 - T_1)$ expressed in K

3.3

representative volume element (R.V.E.)

the minimum volume which is representative of the material considered