

**Advanced technical ceramics - Mechanical properties of  
monolithic ceramics at room temperature - Part 6:  
Guidance for fractographic investigation**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 843-6:2009 sisaldab Euroopa standardi EN 843-6:2009 ingliskeelset teksti.

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English Version

## Advanced technical ceramics - Mechanical properties of monolithic ceramics at room temperature - Part 6: Guidance for fractographic investigation

Céramiques techniques avancées - Propriétés mécaniques des céramiques monolithiques à température ambiante - Partie 6: Guide pour l'analyse fractographique

Hochleistungskeramik - Mechanische Eigenschaften monolithischer Keramik bei Raumtemperatur - Teil 6: Leitlinie für die fraktographische Untersuchung

This European Standard was approved by CEN on 16 July 2009.

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# Contents

Page

<b>Foreword</b> .....	<b>3</b>
<b>1 Scope</b> .....	<b>4</b>
<b>2 Normative references</b> .....	<b>4</b>
<b>3 Terms and definitions</b> .....	<b>4</b>
<b>3.1 General terms</b> .....	<b>4</b>
<b>3.2 Terms classifying inherently volume-distributed fracture origins</b> .....	<b>4</b>
<b>3.3 Terms classifying inherently surface-distributed fracture origins</b> .....	<b>5</b>
<b>3.4 Terms classifying features on fracture surfaces</b> .....	<b>6</b>
<b>4 Significance and use</b> .....	<b>6</b>
<b>5 Apparatus</b> .....	<b>6</b>
<b>5.1 Preparation and cleaning facilities</b> .....	<b>6</b>
<b>5.2 Observational facilities</b> .....	<b>7</b>
<b>6 Recommended procedure</b> .....	<b>9</b>
<b>6.1 Outline</b> .....	<b>9</b>
<b>6.2 Specimen storage and cleaning of fracture surfaces</b> .....	<b>9</b>
<b>6.3 Visual inspection</b> .....	<b>9</b>
<b>6.4 Optical microscope examination</b> .....	<b>10</b>
<b>6.5 Identification of major fracture surface features</b> .....	<b>10</b>
<b>6.6 Scanning electron microscope examination</b> .....	<b>12</b>
<b>6.7 Identification of fracture origin</b> .....	<b>12</b>
<b>6.8 Identification of chemical inhomogeneity at fracture origin</b> .....	<b>13</b>
<b>6.9 Drawing conclusions</b> .....	<b>13</b>
<b>7 Report</b> .....	<b>13</b>
<b>Annex A (informative) Crack patterns in ceramic bodies</b> .....	<b>14</b>
<b>Annex B (informative) Examples of general features of fracture surfaces</b> .....	<b>17</b>
<b>Annex C (informative) Examples of procedure for fracture origin identification</b> .....	<b>19</b>
<b>C.1 Single large pores</b> .....	<b>20</b>
<b>C.2 Agglomerates</b> .....	<b>22</b>
<b>C.3 Large grains</b> .....	<b>24</b>
<b>C.4 Compositional inhomogeneities</b> .....	<b>26</b>
<b>C.5 Delaminations</b> .....	<b>28</b>
<b>C.6 Handling damage</b> .....	<b>30</b>
<b>C.7 Machining damage</b> .....	<b>31</b>
<b>C.8 Oxidation pitting</b> .....	<b>33</b>
<b>C.9 Complex origins</b> .....	<b>35</b>
<b>C.10 No obvious origins</b> .....	<b>36</b>
<b>Annex D (informative) Use of fracture mechanical information to aid fractography</b> .....	<b>37</b>
<b>D.1 Fracture stress and origin size</b> .....	<b>37</b>
<b>D.2 Fracture stress and fracture mirror size</b> .....	<b>40</b>
<b>Annex E (informative) Example layout of reporting pro-forma</b> .....	<b>42</b>
<b>Bibliography</b> .....	<b>44</b>

## Foreword

This document (EN 843-6:2009) 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 February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 843-6:2004.

EN 843 *Advanced technical ceramics – Mechanical properties of monolithic ceramics at room temperature* consists of six parts:

- Part 1: Determination of flexural strength
- Part 2: Determination of Young's modulus, shear modulus and Poisson's ratio
- Part 3: Determination of subcritical crack growth parameters from constant stressing rate flexural strength tests
- Part 4: Vickers, Knoop and Rockwell superficial hardness
- Part 5: Statistical analysis
- Part 6: Guidance for fractographic investigation

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

## 1 Scope

This Part of EN 843 contains guidelines to be adopted when evaluating the appearance of the fracture surface of an advanced technical ceramic. The purpose in undertaking this procedure can be various, for example, for material development or quality assessment, to identify normal or abnormal causes of failure, or as a design aid.

NOTE Not all advanced technical ceramics are amenable to fractography. In particular, coarse-grained ceramics can show such rough surfaces that identifying the fracture origin may be impossible. Similarly, porous materials, especially those of a granular nature, tend not to fracture in a continuous manner, making analysis difficult.

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

## 3 Terms and definitions

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

### 3.1 General terms

#### 3.1.1

##### **crack**

distinct microstructural discontinuity arising during or after manufacture caused by the action of thermal and/or mechanical stress and leading to the generation of new surfaces which do not completely separate

#### 3.1.2

##### **flaw**

inhomogeneity which, through stress concentration, can act as a strength defining feature

NOTE The term flaw used in this sense does not imply that the component is defective.

#### 3.1.3

##### **fracture**

process of propagation of a crack through a test-piece or component

#### 3.1.4

##### **fracture origin**

source from which failure commences

### 3.2 Terms classifying inherently volume-distributed fracture origins

#### 3.2.1

##### **agglomerate**

unintentional microstructural inhomogeneity usually of altered density, for example a cluster of grains of abnormal size, particles, platelets or whiskers, resulting from non-uniformity in processing