EESTI STANDARD

EVS-EN 12788:2005

Advanced technical ceramics - Mechanical properties of ceramic composites at high temperature under inert atmosphere - Determination of flexural strength

Advanced technical ceramics - Mechanical properties of ceramic composites at high temperature under inert atmosphere - Determination of flexural strength

EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA	NATIONAL FOREWORD
Käesolev Eesti standard EVS-EN 12788:2005 sisaldab Euroopa standardi EN 12788:2005 ingliskeelset teksti. Käesolev dokument on jõustatud 25.10.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 12788:2005 consists of the English text of the European standard EN 12788:2005. This document is endorsed on 25.10.2005 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala:	**Scope:**
This document specifies the conditions for determination of the flexural strength of ceramic matrix composite materials with continuous fibre reinforcement under three-point or four-point bending for temperatures up to 2000 °C under vacuum or a gas atmosphere which is inert to the material under test.	This European Standard specifies the conditions for determination of the flexural strength of ceramic matrix composite materials with continuous fibre reinforcement under three-point or four-point bending for temperatures up to 2 000 °C under vacuum or a gas atmosphere which is inert to the material under test.

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English Version

Advanced technical ceramics - Mechanical properties of ceramic composites at high temperature under inert atmosphere - Determination of flexural strength

Céramiques techniques avancées - Propriétés mécaniques des céramiques composites à haute température sous atmosphère inerte - Détermination de la résistance en flexion

Hochleistungskeramik - Mechanische Eigenschaften von keramischen Verbundwerkstoffen bei hoher Temperatur an inerter Atmosphäre - Bestimmung der Biegefestigkeit

This European Standard was approved by CEN on 18 July 2005.

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.

This European Standard exists 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard (EN 12788:2005) 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 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

This document supersedes ENV 12788:1998.

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

1 Scope

This European Standard specifies the conditions for determination of the flexural strength of ceramic matrix composite materials with continuous fibre reinforcement under three-point or four-point bending for temperatures up to 2 000 °C under vacuum or a gas atmosphere which is inert to the material under test.

NOTE 1 The use of these environments is aimed at avoiding changes of the material affecting its flexural strength caused by chemical reaction with its environment during the test.

This European document applies to all ceramic matrix composites with a continuous fibre reinforcement, unidirectional (1D), bidirectional (2D), and tridirectional (xD, with $2 < x \leq 3$), loaded along one principal axis of reinforcement.

NOTE 2 The method outlined in this document should not be used to obtain values of flexural strength for design purposes.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12789, *Advanced technical ceramics — Mechanical properties of ceramic composites at high temperature under air at atmospheric pressure — Determination of flexural strength*

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

EN 60584-2:1993, *Thermocouples — Part 2: Tolerances (IEC 60584-2:1982 + A1:1989)*

ENV 843-5:1996, *Advanced technical ceramics — Monolithic ceramics — Mechanical tests at room temperature — Part 5: Statistical analysis*

EN ISO 7500-1:1999, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

ISO 3611:1978, *Micrometer callipers for external measurement*

3 Terms, definitions and symbols

For the purposes of this European Standard, the following terms, definitions and symbols apply.

3.1
test temperature, T
temperature at the centre of the test piece

3.2
maximum flexural force, F_m
highest recorded force in a flexural test on the test specimen when tested to failure

3.3
flexural stress, σ
nominal stress on the outer surface of the test specimen, calculated at mid span

NOTE This stress is conventionally calculated according to the simple beam theory, the basic assumptions of which may not be met by ceramic matrix composite materials.