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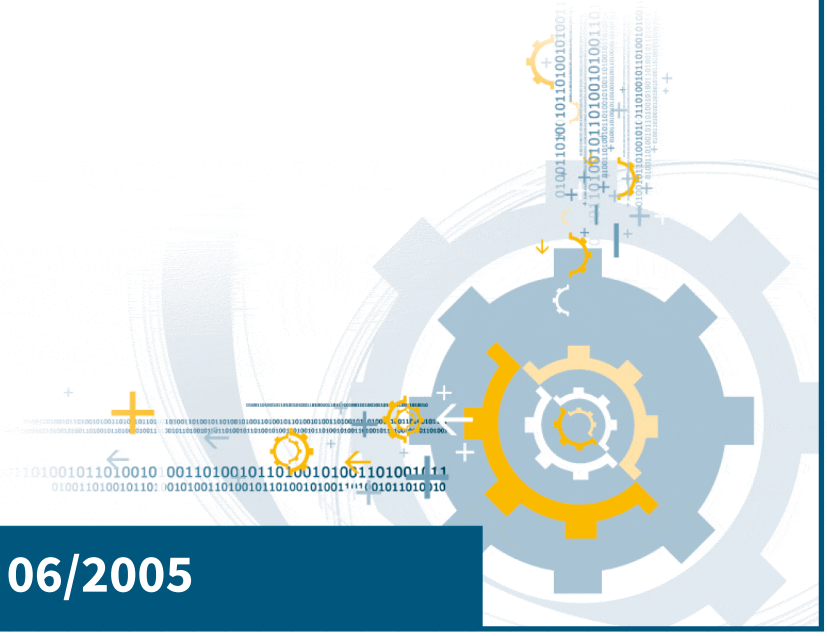
ILNAS-EN 12289:2005



06/2005

National Foreword

This European Standard EN 12289:2005 was adopted as Luxembourgish Standard ILNAS-EN 12289:2005.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

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EUROPEAN STANDARD ILNAS-EN 12289:2005 **EN 12289**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2005

ICS 81.060.30 Supersedes ENV 12289:1996

English version

Advanced technical ceramics - Mechanical properties of ceramic composites at ambient temperature - Determination of in-plane shear properties

Céramiques techniques avancées - Propriétés mécaniques des céramiques composites à température ambiante - Détermination des caractéristiques en cisaillements plan

Hochleistungskeramik - Mechanische Eigenschaften von keramischen Verbundwerkstoffen bei Raumtemperatur - Bestimmung der Schereigenschaften in der Ebene

This European Standard was approved by CEN on 12 May 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.

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Foreword

This document (EN 12289:2005) 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 December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005.

This document supersedes ENV 12289:1996.

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 the determination of the in-plane shear properties at ambient temperature of ceramic matrix composite materials with continuous fibre reinforcement.

This European Standard applies to ceramic matrix composites with a continuous fibre reinforcement, bi-directional (2D) and tri-directional (xD, with $2 < x \leq 3$).

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 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force measuring system (ISO 7500-1:2004).*

ISO 3611, *Micrometer callipers for external measurement*.

3 Terms, definitions and symbols

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

3.1
initial cross-section area, A_0
area of the test piece cross section in the 2,3 plane between the two notches (see Figure A.1)

3.2
measurement zone
part of the test piece, in the 1,2 plane, between the notches, in which a uniform shear field is assumed (see Figure A.1)

NOTE For practical purposes, it is generally assumed to be ± 2 mm on the longitudinal axis of the test piece, on each side of the cross section area.

3.3
in-plane shear strain, γ_{12}
change in angle of an originally orthogonal set of lines parallel to the directions 1 and 2 as a consequence of load application

3.4
in-plane shear, τ_{12}
ratio of applied force to the cross section area

3.5
in-plane shear strength, $\tau_{12,m}$
ratio of the maximum force applied, to the cross section area

3.6
proportionality ratio or pseudo-elastic shear modulus, Gp_{12} elastic shear modulus G_{12}
slope of the linear section of the shear stress-shear strain curve, if any