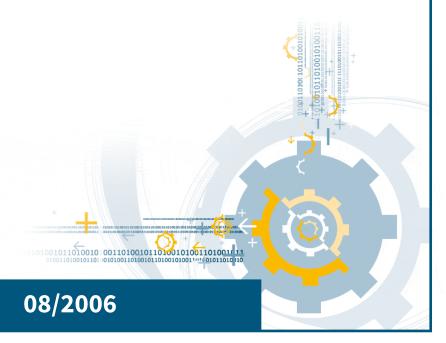


Institut luxembourgeois de la normalisation de l'accréditation, de la sécurité et qualité des produits et services

ILNAS-EN 15158:2006



National Foreword

This European Standard EN 15158:2006 was adopted as Luxembourgish Standard ILNAS-EN 15158:2006.

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

https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

August 2006

ICS 81.060.30

English Version

Advanced technical ceramics - Mechanical properties of ceramic composites at high temperature under inert atmosphere - Determination of fatigue properties at constant amplitude

Céramiques techniques avancées - Propriétés mécaniques des céramiques composites à haute température sous atmosphère inerte - Détermination des propriétés de fatigue à amplitude constante

Hochleistungskeramik - Mechanische Eigenschaften von keramischen Verbundwerkstoffen bei hoher Temperatur in inerter Atmosphäre - Bestimmung der Dauerschwingeigenschaften bei Belastung mit konstanter Amplitude

This European Standard was approved by CEN on 14 July 2006.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

	Contents		Page
	Forew	ord	3
	1	Scope	4
	2	Normative references	4
	3	Terms, definitions and symbols	
	4	Principle	
	5	Significance and use	
		•	
۵	6 61	ApparatusFatigue test machine	
ILNAS e-Shop	6.2	Load train	
	6.3	Test chamber	
	6.4	Set-up for heating	10
	6.5	Extensometer	
Ħ	6.6	Temperature measurement	
via	6.7	Data recording system	
λd	6.8	Micrometers	11
only Cc	7	Test specimens	11
	8	Test specimen preparation	12
≥	8.1	Machining and preparation	
15158:2006 - Preview only Copy	8.2	Number of test specimens	
	9	Test procedure	12
	9.1	Test set-up: temperature considerations	
00	9.2	Measurement of test specimen dimensions	
8:2	9.3	Testing technique	
LNAS-EN 1515	9.4	Test validity	
	10	Calculation of results	15
	10.1	Time to failure, t _f	
	10.2	Damage parameters	15
Z	10.3	Residual properties	
Ι	11	Test report	17
	Annex	A (informative) Schematic evolution of E	18

Foreword

This document (EN 15158:2006) 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 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Scope 1

This European Standard specifies the conditions for the determination of constant-amplitude of load or strain in uniaxial tension/tension or in uniaxial tension/compression cyclic fatigue properties of ceramic matrix composite materials (CMCs) with fibre reinforcement for temperature up to 2 000 °C under vacuum or a gas atmosphere which is inert to the material under test.

NOTE Test environments are specified which are intended to prevent the material under test from chemically reacting with them.

This European Standard applies to all ceramic matrix composites with fibre reinforcement, unidirectional (1D), bi-directional (2D), and tri-directional (xD, where $2 < x \le 3$).

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 658-1, Advanced technical ceramics — Mechanical properties of ceramic composites at room temperature — Part 1: Determination of tensile properties

EN 1892, Advanced technical ceramics — Mechanical properties of ceramic composites at high temperature under inert atmosphere — Determination of tensile properties

EN 1893, Advanced technical ceramics — Mechanical properties of ceramic composites at high temperature in air at atmospheric pressure — Determination of tensile properties

EN 12291, Advanced technical ceramics — Mechanical properties of ceramic composites at high temperature in air at atmospheric pressure — Determination of compression properties

prCEN/TR 13233:2007¹, Advanced technical ceramics — Notations and symbols

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

EN 60584-2, Thermocouples — Part 2: Tolerances (IEC 60584-2:1982)

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

EN ISO 9513, Metallic materials — Calibration of extensometers used in uniaxial testing (ISO 9513:1999)

ISO 3611, Micrometer callipers for external measurement

¹ To be published in 2007