



BSI Standards Publication

Advanced technical ceramics — Mechanical properties of ceramic fibres at high temperature in a non-reactive environment — Determination of creep behaviour by the cold end method

National foreword

This British Standard is the UK implementation of EN 15365:2010.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

**Advanced technical ceramics - Mechanical properties of ceramic
fibres at high temperature in a non-reactive environment -
Determination of creep behaviour by the cold end method**

Céramiques techniques avancées - Propriétés mécaniques
des fibres céramiques à haute température sous
environnement non-réactif - Détermination du
comportement au fluage par la méthode des mors froids

Hochleistungskeramik - Mechanische Eigenschaften von
Keramikfasern bei hohen Temperaturen in einer
reaktionsfreien Umgebung - Bestimmung des
Kriechverhaltens im Kaltverbindungsverfahren

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Foreword

This document (EN 15365:2010) 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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1 Scope

This European Standard specifies the conditions for the determination of the tensile creep deformation and failure behaviour of single filaments of ceramic fibres at high temperature and under test conditions that prevent changes to the material as a result of chemical reaction with the test environment.

This European Standard applies to continuous ceramic filaments taken from tows, yarns, braids and knittings, which have strains to fracture less than or equal to 5 %.

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 60584 (all parts), *Thermocouples*

CEN/TR 13233:2007, *Advanced technical ceramics — Notations and symbols*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TR 13233:2007 and the following apply.

3.1
creep
time-dependent increase of gauge length starting from the time when the constant specified level of force is reached

3.2
creep threshold temperature
 T_t
minimum temperature at which creep is detected

3.3
specimen temperature
 T
temperature which varies along the fibre length in the cold grips case

NOTE See 8.2.

3.4
specimen temperature in the zone
 T_i
temperature defined as: $T_t \leq T_i \leq T_t + i \Delta T$

3.5
total length
 L
total length of the ceramic filament between the grips

3.6
length
 L_i
length of the ceramic filament at temperature T_i

3.7

initial effective cross sectional area

A_0

initial cross sectional area of the ceramic filament within the gauge length

3.8

applied tensile force

F

constant force applied to the ceramic filament during the test

3.9

applied tensile stress

σ

applied tensile force divided by the initial cross sectional area

3.10

longitudinal deformation

ΔL

change in the total length of the ceramic filament caused by creep

3.11

longitudinal deformation

ΔL_i

change of the filament caused by creep at temperature T_i

3.12

tensile creep strain

$\varepsilon_{cr}(T)$

relative change in length in the controlled zone at time t , caused by creep at the temperature T

NOTE The value corresponding to rupture is denoted $\varepsilon_{cr,m}$.

3.13

creep rupture time

$t_{cr,m}$

time elapsed from the moment when loading is completed until the moment of rupture

3.14

creep strain rate

$\dot{\varepsilon}_{cr}(T)$

change in creep strain per unit time at time t at the temperature T_i

3.15

creep type

primary, secondary or tertiary creep

3.16

primary creep

part of the creep strain versus time curve which presents a decreasing creep strain rate

NOTE See Figure 1.

3.17

secondary creep

part of the creep strain versus time curve which presents a constant creep strain rate

NOTE See Figure 1.