SLOVENSKI STANDARD

kSIST FprEN 15365:2010

01-februar-2010

Sodobna tehniį na keramika - Mehanske lastnosti keramiį nih vlaken pri visokih temperaturah v nereaktivnem okolju - Doloį itev lezenja po metodi hladnega spajanja (cold end method)

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

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

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

Ta slovenski standard je istoveten z: **FprEN 15365**

ICS:

81.060.30	Sodobna keramika	Advanced ceramics

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

FINAL DRAFT
FprEN 15365

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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

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

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Foreword

This document (FprEN 15365:2009) has been prepared by Technical Committee CEN/TC 184 “Advanced technical ceramics”, the secretariat of which is held by BSI.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede CEN/TS 15365:2006.

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.

CEN/TR 13233:2007, *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 + A1:1989)*

EN 60584-3, *Thermocouples — Part 3: Extension and compensating cables — Tolerances and identification systems (IEC 60584-3:2007)*

3 Terms and definitions

For the purposes of this European standard, 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
difference in temperature between the different furnace zones, ΔT
set by the operator

3.5
specimen temperature in the zone, T_i
temperature defined as: $T_t \leq T_i \leq T_t + i\,\Delta T$

3.6
total length, L
total length of the ceramic filament between the grips

3.7
length, L_i
length of the ceramic filament at temperature T_i

3.8
initial effective cross sectional area, A_0
initial cross sectional area of the ceramic filament within the gauge length

3.9
applied tensile force, F
constant force applied to the ceramic filament during the test

3.10
applied tensile stress, σ
applied tensile force divided by the initial cross sectional area

3.11
longitudinal deformation, ΔL
change in the total length of the ceramic filament caused by creep

3.12
longitudinal deformation, ΔL_i
change of the filament caused by creep at temperature T_i

3.13
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 $\varepsilon_{cr,m}$.

3.14
creep rupture time, $t_{cr,m}$
time elapsed from the moment when loading is completed until the moment of rupture

3.15
creep strain rate, $\dot{\varepsilon}_{cr(T)}$
change in creep strain per unit time at time t at the temperature T_i

3.16
creep types
primary, secondary and tertiary creep

3.17
primary creep
part of the creep strain versus time curve which presents a decreasing creep strain rate

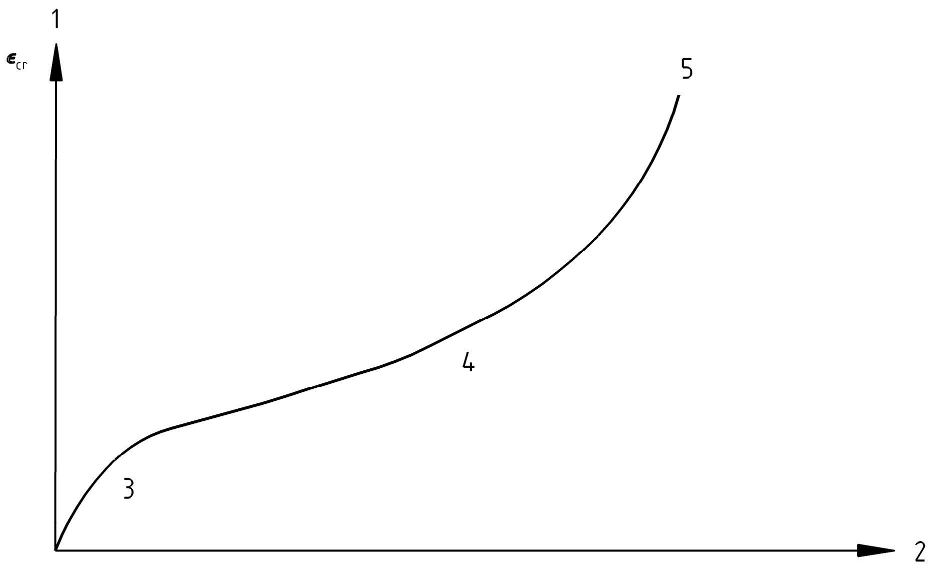
NOTE See Figure 1.

3.18
secondary creep
part of the creep strain versus time curve which presents a constant creep strain rate

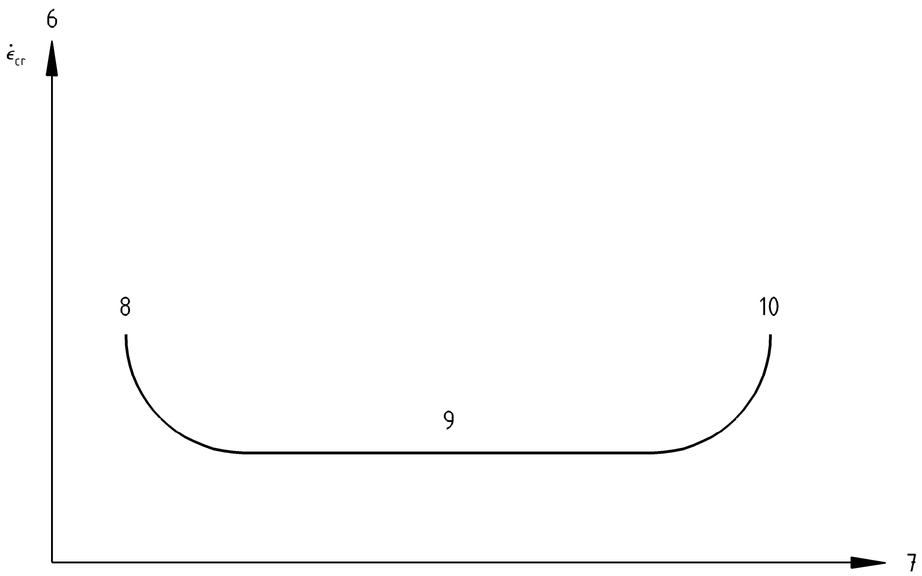
NOTE See Figure 1.

3.19
tertiary creep
part of the creep strain versus time curve which presents an increasing creep strain rate

NOTE See Figure 1.



a) Creep strain versus time



b) Creep strain rate versus time

Key

1 Creep strain ε_{cr}

2 Time *t*

3 Primary creep

4 Secondary creep

5 Tertiary creep

6 Creep strain rate $\dot{\varepsilon}_{cr}$ (creep strain with time)

7 Time

8 Primary creep

9 Secondary creep

10 Tertiary creep

Figure 1 — Creep strain and creep strain rate versus time curves