SLOVENSKI STANDARD
SIST EN ISO 20323:2021

01-september-2021

Fina keramika (sodobna keramika, sodobna tehnična keramika) - Mehanske lastnosti keramičnih kompozitov pri temperaturi okolice in pri zračnem tlaku - Ugotavljanje nateznih lastnosti cevi (ISO 20323:2018)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at ambient temperature in air atmospheric pressure - Determination of tensile properties of tubes (ISO 20323:2018)

Hochleistungskeramik - Mechanische Eigenschaften keramischer Verbundwerkstoffe bei Umgebungstemperatur unter atmosphärischen Luftdruck - Bestimmung der Zugeigenschaften von Röhren (ISO 20323:2018)

Céramiques techniques - Propriétés mécaniques des composites céramiques à température ambiante et à pression atmosphérique - Détermination des propriétés en traction de tubes (ISO 20323:2018)

Ta slovenski standard je istoveten z: **EN ISO 20323:2021**

ICS:

81.060.30	Sodobna keramika	Advanced ceramics

SIST EN ISO 20323:2021 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 20323

July 2021

ICS 81.060.30

English Version

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at ambient temperature in air atmospheric pressure - Determination of tensile properties of tubes (ISO 20323:2018)

Céramiques techniques - Propriétés mécaniques des composites céramiques à température ambiante et à pression atmosphérique - Détermination des propriétés en traction de tubes (ISO 20323:2018)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of ISO 20323:2018 has been prepared by Technical Committee ISO/TC 206 "Fine ceramics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 20323:2021 by Technical Committee CEN/TC 184 "Advanced technical ceramics" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by January 2022, and conflicting national standards shall be withdrawn at the latest by January 2022.

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Endorsement notice

The text of ISO 20323:2018 has been approved by CEN as EN ISO 20323:2021 without any modification.

INTERNATIONAL STANDARD

ISO 20323

First edition
2018-03

Fine ceramics (advanced ceramics, advanced technical ceramics) — Mechanical properties of ceramic composites at ambient temperature in air atmospheric pressure — Determination of tensile properties of tubes

Céramiques techniques — Propriétés mécaniques des composites céramiques à température ambiante et à pression atmosphérique — Détermination des propriétés en traction de tubes

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

Fine ceramics (advanced ceramics, advanced technical ceramics) — Mechanical properties of ceramic composites at ambient temperature in air atmospheric pressure — Determination of tensile properties of tubes

1 Scope

This document specifies the conditions for the determination of tensile properties of ceramic matrix composite tubes with continuous fibre-reinforcement at ambient temperature in air atmospheric pressure. This document is specific to the tubular geometries since fibre architecture and specimen geometry factors are distinctly different in composite tubes than in flat specimens.

This document provides information on the uniaxial tensile properties and tensile stress-strain response such as tensile strength and strain, tensile elastic modulus and Poisson's ratio. The information may be used for material development, control of manufacturing (quality insurance), material comparison, characterization, reliability and design data generation for tubular components.

This document addresses, but is not restricted to, various suggested test piece fabrication methods. It applies primarily to ceramic and/or glass matrix composite tubes with a continuous fibrous-reinforcement: unidirectional (1D filament winding and tape lay-up), bi-directional (2D braid and weave) and tri-directional (xD, with $2 < x < 3$), loaded along the tube axis.

Values expressed in this document are in accordance with the International System of Units (SI).

NOTE In most cases, ceramic matrix composites to be used at high temperature in air are coated with an antioxidation coating.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 20507, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Vocabulary*

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

ISO 17161, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Ceramic composites — Determination of the degree of misalignment in uniaxial mechanical tests*

ISO 9513, *Metallic materials — Calibration of extensometer systems used in uniaxial testing*

ISO 3611, *Geometrical product specifications (GPS) — Dimensional measuring equipment: Micrometers for external measurements — Design and metrological characteristics*

ASTM E2208-02, *Standard Guide for Evaluating Non-Contacting Optical Strain Measurement Systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20507 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
calibrated length
l
part of the test specimen that has uniform and minimum external diameter

3.2
gauge length
L_0
initial distance between reference points on the test specimen in the calibrated length

3.3
initial cross-section area
S_0
area of the test specimen within the calibrated length

3.4
effective cross-section area
$S_{0,\mathrm{eff}}$
total area corrected by a factor, to account for the presence of an anti-oxidative protection

3.5
external diameter
d_o
outer distance through the centre of a tube from one side to the other

3.6
internal diameter
d_i
inner distance through the centre of a tube from one side to the other

3.7
longitudinal deformation
A
increase in the gauge length between reference points under a tensile force

3.8
longitudinal deformation under maximum tensile force
A_m
increase in the gauge length between reference points under maximum tensile force

3.9
tensile strain
$\varepsilon_{\mathrm{zz}}$
relative change in the gauge length defined as the ratio A/L_0

3.10
tensile strain under maximum force
$\varepsilon_{\mathrm{zz,m}}$
relative change in the gauge length defined as the ratio A_m/L_0

3.11
circumferential strain
$\varepsilon_{\theta\theta}$
relative change in circumferential direction in the gauge length

