



SLOVENSKI STANDARD SIST EN ISO 20504:2016

01-junij-2016

Nadomešča:
SIST EN 658-2:2004

Fina keramika (sodobna keramika, sodobna tehnična keramika) - Metoda za preskušanje tlačnih lastnosti kompozitov, ojačenih z neskončno dolgimi vlakni, pri sobni temperaturi (ISO 20504:2006)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for compressive behaviour of continuous fibre-reinforced composites at room temperature (ISO 20504:2006)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Hochleistungskeramik - Bestimmung der Eigenschaften unter Druck von endlosfaserverstärkten Verbundwerkstoffen bei Raumtemperatur (ISO 20504:2006)

[SIST EN ISO 20504:2016](https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-31164117-276/sist-en-iso-20504-2016)

[https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-](https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-31164117-276/sist-en-iso-20504-2016)

Céramiques techniques - Méthode d'essai de résistance à la compression des composites renforcés de fibres continues à température ambiante (ISO 20504:2006)

Ta slovenski standard je istoveten z: EN ISO 20504:2016

ICS:

81.060.30 Sodobna keramika Advanced ceramics

SIST EN ISO 20504:2016 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 20504:2016

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>

EUROPEAN STANDARD

EN ISO 20504

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2016

ICS 81.060.30

Supersedes EN 658-2:2002

English Version

Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for compressive behaviour of continuous fibre-reinforced composites at room temperature (ISO 20504:2006)

Céramiques techniques - Méthode d'essai de résistance à la compression des composites renforcés de fibres continues à température ambiante (ISO 20504:2006)

Hochleistungskeramik - Bestimmung der Eigenschaften unter Druck von endlosfaserverstärkten Verbundwerkstoffen bei Raumtemperatur (ISO 20504:2006)

This European Standard was approved by CEN on 25 March 2016.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 20504:2016](https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016)
<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>

European foreword

The text of ISO 20504:2006 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 20504:2016 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 October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 658-2:2002.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

[SIST EN ISO 20504:2016](https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016)

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>

Endorsement notice

The text of ISO 20504:2006 has been approved by CEN as EN ISO 20504:2016 without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 20504:2016

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>

INTERNATIONAL
STANDARD

ISO
20504

First edition
2006-01-15

**Fine ceramics (advanced ceramics,
advanced technical ceramics) — Test
method for compressive behaviour of
continuous fibre-reinforced composites
at room temperature**

iTeh STANDARD PREVIEW
*Céramiques techniques — Méthode d'essai de résistance à la
compression des composites renforcés de fibres continues à
température ambiante*
(standards.iteh.ai)

[SIST EN ISO 20504:2016](https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016)

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>



Reference number
ISO 20504:2006(E)

© ISO 2006

ISO 20504:2006(E)**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 20504:2016

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>

© ISO 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Principle.....	3
5 Apparatus	4
5.1 Test machine	4
5.2 Load train.....	4
5.3 Strain measurement	4
5.3.1 General.....	4
5.3.2 Strain gauges	4
5.3.3 Extensometry	5
5.4 Data recording system	5
5.5 Dimension measuring devices	5
6 Test specimens.....	5
6.1 General.....	5
6.2 Compression between platens	6
6.3 Test specimen used with grips	7
7 Test specimen preparation	10
7.1 Machining and preparation	10
7.2 Number of test specimens.....	10
8 Test procedure	10
8.1 Test mode and rate	10
8.2 Measurement of test specimen dimensions	11
8.3 Buckling.....	11
8.4 Testing technique	11
8.4.1 Test specimen mounting	11
8.4.2 Extensometers	11
8.4.3 Measurements	12
8.5 Test validity	12
9 Calculation of results	12
9.1 Test specimen origin	12
9.2 Compressive strength	12
9.3 Strain at maximum compressive force.....	13
9.4 Proportionality ratio or pseudo-elastic modulus, elastic modulus	13
9.5 Buckling stress	14
9.6 Rounding of results	14
9.7 Mean and standard deviation	14
10 Test report	15
Annex A (informative) Illustration of elastic modulus	16
Annex B (normative) Alignment verification	18
Annex C (normative) Compressive force limits to ensure ‘true’ compressive failure.....	20

ISO 20504:2006(E)**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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 20504 was prepared by Technical Committee ISO/TC 206, *Fine ceramics*.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 20504:2016](https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016)

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>

Fine ceramics (advanced ceramics, advanced technical ceramics) — Test method for compressive behaviour of continuous fibre-reinforced composites at room temperature

1 Scope

This International Standard describes procedures for determination of the compressive behaviour of ceramic matrix composite materials with continuous fibre reinforcement at room temperature. This method applies to all ceramic matrix composites with a continuous fibre reinforcement, uni-directional (1D), bi-directional (2D) and tri-directional (x D, with $2 < x \leq 3$), tested along one principal axis of reinforcement. This method may also be applied to carbon-fibre-reinforced carbon matrix composites (also known as: carbon/carbon or C/C). Two cases of testing are distinguished: compression between platens and compression using grips.

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.

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 3611, *Micrometer callipers for external measurements*

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

ISO 14126, *Fibre-reinforced plastic composites — Determination of compressive properties in the in-plane direction*

ASTM E1012, *Standard Practice for Verification of Test Frame and Specimen Alignment Under Tensile and Compressive Axial Force Application*

3 Terms and definitions

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

3.1

gauge section

part of the test specimen which has uniform and minimum cross-sectional area

3.2

gauge section length

l

length of the gauge section

ISO 20504:2006(E)

3.3

initial gauge length L_0

initial distance between reference points on the test specimen in the gauge section before initiation of the test

3.4

final gauge length L_f

final distance between reference points on the test specimen in the gauge section at the completion of the test

3.5

initial cross-sectional area A_0

initial area of the gauge section's cross-section

3.6

longitudinal deformation ΔL

change (contraction) of the initial gauge due to the application of a uniaxial compressive force

NOTE The longitudinal deformation corresponding to the maximum force should be denoted as $\Delta L_{c,m}$.

3.7

compressive strain ε relative change in the gauge length defined as the ratio $\Delta L/L_0$ NOTE The compressive strain corresponding to the maximum force is denoted as $\varepsilon_{c,m}$.

3.8

compressive force F_c

uniaxial compressive force applied to a test specimen

3.9

maximum compressive force $F_{c,m}$

greatest uniaxial compressive force applied to a test specimen when tested to failure

3.10

compressive stress σ compressive force supported by the test specimen at any time in the test divided by the initial cross-sectional area such that $\sigma = F_c/A_0$

3.11

compressive strength $S_{c,m}$

greatest compressive stress applied to a test specimen when tested to failure

3.12

proportionality ratio or pseudo-elastic modulus E_p

slope of the linear region of the stress-strain curve, if any

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 20504:2016

<https://standards.iteh.ai/catalog/standards/sist/8bcad25a-5973-416e-a871-3c1647b7c376/sist-en-iso-20504-2016>