

First edition
2019-12

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

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



Reference number
ISO 21971:2019(E)

© ISO 2019

This is a preview of "ISO 21971:2019". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO 21971:2019". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	3
5 Apparatus	4
5.1 Pressurizing system.....	4
5.2 Test specimen gripping and end closure.....	4
5.3 Strain measurement.....	5
5.3.1 General.....	5
5.3.2 Strain gauges.....	5
5.3.3 Digital image correlation.....	5
5.4 Pressure and data recording systems.....	6
5.5 Measurement of dimensions.....	6
6 Tubular test specimen	7
6.1 Specimen specifications.....	7
6.1.1 General.....	7
6.1.2 Dimension.....	7
6.1.3 Geometry.....	7
6.1.4 Tolerances and variability.....	8
6.2 Specimen preparation.....	8
6.2.1 General.....	8
6.2.2 As-fabricated.....	8
6.2.3 Application-matched machining.....	9
6.2.4 Customary practices.....	9
6.2.5 Standard procedure.....	9
6.3 Test count and test specimens sampling.....	9
7 Test procedure	9
7.1 General.....	9
7.2 Test mode and rates.....	9
7.3 Testing technique.....	10
7.3.1 Measurement of test specimen dimensions.....	10
7.3.2 Instrumentation of test specimen.....	10
7.3.3 Setting-up of strain measurement means.....	10
7.3.4 Measurements.....	11
7.3.5 Post-test analyses.....	12
7.4 Test validity.....	12
8 Calculation of results	12
8.1 Test specimen origin.....	12
8.2 Hoop tensile stress and strain.....	12
8.3 Hoop tensile strength and corresponding strain.....	13
8.4 Proportionality ratio or pseudo-elastic modulus in circumferential direction.....	14
8.4.1 Stress-strain curves with a linear region.....	14
8.4.2 Nonlinear stress-strain curves.....	14
8.5 Poisson's ratio (optional).....	15
8.6 Statistics.....	15
9 Test report	15
9.1 General.....	15
9.2 Testing information.....	15
9.3 Test specimen and material.....	16
9.3.1 Tubular test specimen drawing or reference.....	16

This is a preview of "ISO 21971:2019". [Click here to purchase the full version from the ANSI store.](#)

9.3.2	Description of the test material	16
9.4	Equipment and test parameters	16
9.5	Test results.....	16
Bibliography		18

This is a preview of "ISO 21971:2019". [Click here to purchase the full version from the ANSI store.](#)

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.