



NSAI
Standards

Irish Standard
I.S. EN ISO 17138:2022

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at room temperature - Determination of flexural strength (ISO 17138:2014)

I.S. EN ISO 17138:2022

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National Foreword

I.S. EN ISO 17138:2022 is the adopted Irish version of the European Document EN ISO 17138:2022, Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at room temperature - Determination of flexural strength (ISO 17138:2014)

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EUROPEAN STANDARD

EN ISO 17138

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2022

ICS 81.060.30

Supersedes EN 658-3:2002

English Version

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at room temperature - Determination of flexural strength (ISO 17138:2014)

Céramiques techniques - Propriétés mécaniques des composites céramiques à température ambiante - Détermination de la résistance en flexion (ISO 17138:2014)

Hochleistungskeramik - Mechanische Eigenschaften von keramischen Verbundwerkstoffen bei Raumtemperatur - Bestimmung der Biegefestigkeit (ISO 17138:2014)

This European Standard was approved by CEN on 27 March 2022.

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EN ISO 17138:2022 (E)

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European foreword

The text of ISO 17138:2014 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 17138:2022 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of an identical text or by endorsement, at the latest by October 2022, and conflicting national standards shall be withdrawn at the latest by October 2022.

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

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Endorsement notice

The text of ISO 17138:2014 has been approved by CEN as EN ISO 17138:2022 without any modification.

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INTERNATIONAL STANDARD

**ISO
17138**

First edition
2014-12-01

Fine ceramics (advanced ceramics, advanced technical ceramics) — Mechanical properties of ceramic composites at room temperature — Determination of flexural strength

*Céramiques techniques — Propriétés mécaniques des composites
céramiques à température ambiante — Détermination de la
résistance en flexion*



Reference number
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ISO 17138:2014(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.

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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 206, *Fine ceramics*.

Fine ceramics (advanced ceramics, advanced technical ceramics) — Mechanical properties of ceramic composites at room temperature — Determination of flexural strength

1 Scope

This International Standard describes a method for the determination of the flexural strength of ceramic matrix composite materials with continuous fibre reinforcement, under three-point or four-point bend at room temperature. This method applies to all ceramic matrix composites with a continuous fibre reinforcement, unidirectional (1D), bidirectional (2D), and tridirectional xD with ($2 < x \leq 3$) as defined in CEN/TR 13233, loaded along one principal axis of reinforcement.

NOTE The method is not intended to be used to obtain absolute values of strength for design purposes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *Geometrical product specifications (GPS) — Dimensional measuring equipment: Micrometers for external measurements — Design and metrological characteristics*

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

3 Terms, definitions, and symbols

For the purposes of this document, the terms and definitions given in CEN/TR 13233¹⁾ and the following apply.

3.1

maximum flexural force

F_m

highest recorded force in a flexural test on the test specimen when tested to failure

3.2

flexural stress

σ

nominal stress on the outer surface of the test specimen, calculated at mid-span

Note 1 to entry: This stress is conventionally calculated according to the beam theory, whose basic assumptions cannot be met by ceramic matrix composite materials.

3.3

flexural strength

$\sigma_{f,m}$

maximum flexural stress applied to a test specimen that fractures during a flexural test

1) An International Standard, ISO 19634, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Notations and symbols of ceramic composites* is under preparation.

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