ICS 81.060.30 SLOVENSKÁ TECHNICKÁ NORMA Máj 2025

| STN | **Jemná keramika (špeciálna keramika, špeciálna technická keramika) Mechanické vlastnosti keramických kompozitov pri izbovej teplote Stanovenie interlaminárnej pevnosti v šmyku a šmykového modulu kompozitov vystužených nekonečnými vláknami stlačením skúšobných kusov s dvojitým vrubom a testom Iosipescu (ISO 20505: 2023)** | **STN EN ISO 20505**<br><br>72 7519 |
|---|---|---|

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at room temperature - Determination of the interlaminar shear strength and shear modulus of continuous-fibre-reinforced composites by the compression of double-notched test pieces and by the Iosipescu test (ISO 20505:2023)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/25

Obsahuje: EN ISO 20505:2025, ISO 20505:2023

Oznámením tejto normy sa ruší
STN EN 658-4 (72 7519) z októbra 2003

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NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 20505

February 2025

ICS 81.060.30 Supersedes EN 658-4:2003

English Version

# Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at room temperature - Determination of the interlaminar shear strength and shear modulus of continuous-fibre-reinforced composites by the compression of double-notched test pieces and by the Iosipescu test (ISO 20505:2023)

Céramiques techniques - Propriétés mécaniques des céramiques composites à température ambiante - Détermination de la résistance au cisaillement interlaminaire et du module de cisaillement des composites renforcés par des fibres continues, par la compression d'éprouvettes à double entaille et par l'essai Iosipescu (ISO 20505:2023)

Hochleistungskeramik - Mechanische Eigenschaften von keramischen Verbundwerkstoffen bei Raumtemperatur - Bestimmung der Scherfestigkeit und des Schubmoduls endlosfaserverstärkter Verbundwerkstoffe durch Druckbeanspruchung von doppeltgekerbten Proben und durch den Iosipescu-Test (ISO 20505:2023)

This European Standard was approved by CEN on 24 February 2025.

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

**EN ISO 20505:2025 (E)**

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## European foreword

The text of ISO 20505:2023 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 20505:2025 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 August 2025, and conflicting national standards shall be withdrawn at the latest by August 2025.

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 20505:2023 has been approved by CEN as EN ISO 20505:2025 without any modification.

INTERNATIONAL STANDARD

**ISO 20505**

Second edition
2023-10

# Fine ceramics (advanced ceramics, advanced technical ceramics) — Mechanical properties of ceramic composites at room temperature — Determination of the interlaminar shear strength and shear modulus of continuous-fibre-reinforced composites by the compression of double-notched test pieces and by the Iosipescu test

*Céramiques techniques — Propriétés mécaniques des céramiques composites à température ambiante — Détermination de la résistance au cisaillement interlaminaire et du module de cisaillement des composites renforcés par des fibres continues, par la compression d'éprouvettes à double entaille et par l'essai Iosipescu*

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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 document 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 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*.

This second edition cancels and replaces the first edition (ISO 20505:2005), which has been technically revised.

The main changes are as follows:

— Scope revised to include the possibility of measuring the interlaminar shear modulus through the use of a gauges-instrumented Iosipescu sample;

— new entries added to Clause 3;

— 5.3 and 7.2 specify requirements on the gauges-instrumented Iosipescu sample;

— 9.3, 9.4 and 9.5 define formulae to determine the shear modulus;

— material orientation added to Figure 2 and Figure 3;

— subclause on test validity added (8.4);

— Table 1 and Table 2 updated;

— Annex A replaced by a method to verify the shear stress field in the Iosipescu test to ensure that that there are no coupling effects that make this document unsuitable for determining the interlaminar shear properties of the material;

— minor editorial corrections;

— structure revised;

— symbols and notation modified in accordance with ISO 19634.

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.

INTERNATIONAL STANDARD ISO 20505:2023(E)

# Fine ceramics (advanced ceramics, advanced technical ceramics) — Mechanical properties of ceramic composites at room temperature — Determination of the interlaminar shear strength and shear modulus of continuous-fibre-reinforced composites by the compression of double-notched test pieces and by the Iosipescu test

## 1 Scope

This document specifies a method for the determination of interlaminar shear strength at ambient temperature by the compression of a double-notched test piece and a method for the determination of interlaminar shear strength and modulus at ambient temperature by the Iosipescu test. This document applies to all ceramic matrix composites with a continuous fibre reinforcement, having unidirectional (1D), bidirectional (2D) and multidirectional (xD, with x > 2) fibre architecture, where a major part of reinforcements is a stack of plies.

This document is applicable to material development, material comparison, quality assurance, characterization, reliability and design data generation. The simpler compression test method of a double-notched test piece is applicable only when the shear strength has to be measured.

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

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 19634, *Fine ceramics (advanced ceramics, advanced technical ceramics) — Ceramic composites — Notations and symbols*

ISO 20507, *Advanced ceramics — Vocabulary*