



BSI Standards Publication

Plastics — Determination of tensile properties

Part 5: Test conditions for unidirectional fibre-reinforced plastic composites

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National foreword

This British Standard is the UK implementation of EN ISO 527-5:2021. It is identical to ISO 527-5:2021. It supersedes BS EN ISO 527-5:2009, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/42, Fibre reinforced thermosetting plastics and prepregs.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 527-5:2021) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.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

This document supersedes EN ISO 527-5:2009.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 527-5:2021 has been approved by CEN as EN ISO 527-5:2021 without any modification.

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Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	5
5 Apparatus	5
6 Test specimens	5
6.1 Shape and dimensions.....	5
6.1.1 General.....	5
6.1.2 Type A specimen (for longitudinal direction).....	7
6.1.3 Type B specimen (for transverse direction).....	7
6.2 Preparation of specimens.....	7
6.2.1 General.....	7
6.2.2 End tabs.....	7
6.2.3 Application of end tabs.....	7
6.3 Gauge marks.....	7
6.4 Checking the specimens.....	7
7 Number of specimens	8
8 Conditioning	8
9 Procedure	8
9.1 Test atmosphere.....	8
9.2 Measurement of specimen dimensions.....	8
9.3 Clamping.....	8
9.4 Prestresses.....	8
9.5 Setting of extensometers and strain gauges and placing of gauge marks.....	8
9.6 Test speed.....	8
9.7 Recording of data.....	8
10 Calculation and expression of results	8
10.1 Calculation of all properties for parallel sided specimens (Type A and B).....	8
11 Precision	9
12 Test report	9
Annex A (informative) Alignment of specimens	10
Annex B (informative) Use of unbonded tabs and conditions for gripping tab-less specimens using fine grip faces	12
Annex C (normative) Specimen preparation for type A and type B	15
Bibliography	17

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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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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 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 527-5:2009), which has been technically revised. The main changes compared to the previous edition are as follows:

- gripping force or pressure (e.g. via torque or manometer depending on gripping system used) has been adjusted;
- a new [Annex B](#) (Use of unbonded tabs and conditions for gripping tab-less specimens using fine grip faces) has been added.

A list of all parts in the ISO 527 series can be found on the ISO website.

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.

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Plastics — Determination of tensile properties —

Part 5:

Test conditions for unidirectional fibre-reinforced plastic composites

1 Scope

This document specifies the test conditions for the determination of the tensile properties of unidirectional fibre-reinforced plastic composites, based upon the general principles given in ISO 527-1.

NOTE Isotropic and orthotropic reinforced materials are covered by ISO 527-4.

The methods are used to investigate the tensile behaviour of the test specimens and for determining the tensile strength, tensile modulus, Poisson's ratios and other aspects of the tensile stress-strain relationship under the conditions defined.

The test method is suitable for all polymer matrix systems reinforced with unidirectional fibres and which meet the requirements, including failure mode, set out in this document.

The method is suitable for composites with either thermoplastic or thermosetting matrices, including prepregged materials (prepregs). The reinforcements covered include carbon fibres, glass fibres, aramid fibres and other similar fibres. The reinforcement geometries covered include unidirectional (i.e. completely aligned) fibres and rovings and unidirectional fabrics and tapes.

The method is not normally suitable for multidirectional materials composed of several unidirectional layers at different angles (see ISO 527-4).

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 527-1:2019, *Plastics — Determination of tensile properties — Part 1: General principles*

ISO 1268 (all parts), *Fibre-reinforced plastics — Methods of producing test plates*

ISO 2818, *Plastics — Preparation of test specimens by machining*

ISO 16012, *Plastics — Determination of linear dimensions of test specimens*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 <https://www.electropedia.org/>