
Aeronavtika - Električni kabli za uporabo v zračnih plovilih - Preskusne metode - 505. del: Natezni preskus vodnikov in žic

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 505: Tensile test on conductors and strands

Luft- und Raumfahrt - Elektrischen Leitungen für Luftfahrt Verwendung - Prüfverfahren - Teil 505: Zugfestigkeit der Einzeldrähte und Leiterseile

Série aérospatiale - Câbles électriques à usages aéronautique - Méthodes d'essai - Partie 505 : Résistance à la traction des conducteurs et des brins

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Ta slovenski standard je istoveten z: prEN 3475-505

ICS:

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49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

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EUROPEAN STANDARD
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Will supersede EN 3475-505:2012

English Version

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 505: Tensile test on conductors and strands

Série aérospatiale - Câbles électriques à usages
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Zugfestigkeit der Einzeldrähte und Leiterseile

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

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

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

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European foreword

This document (prEN 3475-505:2020) has been prepared by the Aerospace and Defence Industries Association of Europe – Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 3475-505:2012.

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1 Scope

This document specifies a method of measuring the tensile properties of stranded conductors, strands, solid conductors and braids.

When required, it can be used also on finished cables.

It is intended to be used together with EN 3475-100.

2 Normative references

There are no normative references in this document.

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/ui>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

tensile strength at break

ultimate tensile strength

limit stress at which material actually breaks, with sudden release of the stored elastic energy (released as noise and/or heat and/or more cracks, e.g. for brittle materials). This point is the fracture marked X on the curve below

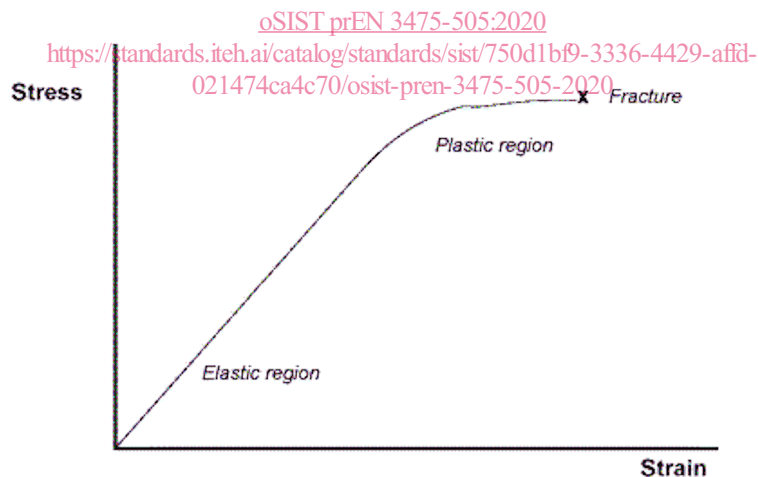


Figure 1

3.2

ultimate elongation

elongation at break

elongation of material at rupture under tensile loading as per formula:

$$\text{Elongation } (\%) = \Delta L / L_0$$

3.3

elastic limit

yield strength

maximum stress that can be developed in a material without causing plastic deformation. It is the stress at which a material starts to exhibit a permanent deformation and is a practical approximation of elastic limit

3.4

offset yield strength

conventional elastic limit

stress, determined from a stress-strain diagram, corresponding to the intersection of the stress-strain curve and a line parallel to its straight-line portion offset by a specified strain

Offset for metals is specified as 0,2 % ($R_{p0,2}$ %), i.e. the intersection of the offset line and the 0-stress axis is at 0,2 % strain

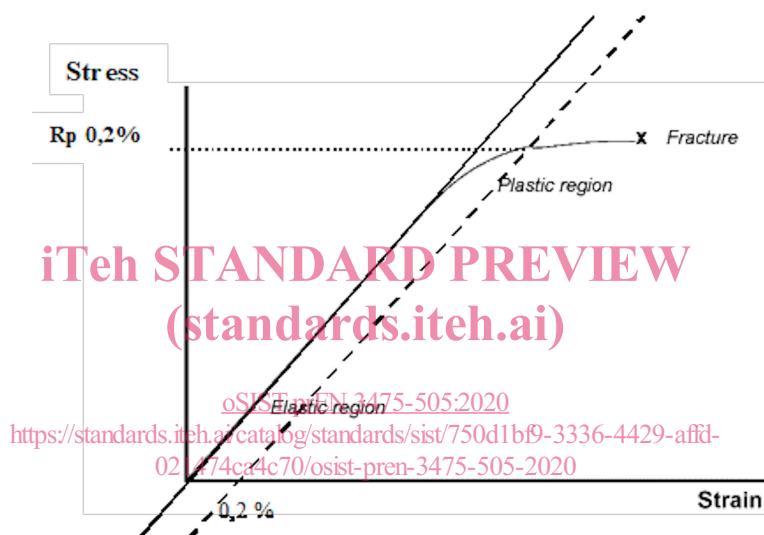


Figure 2

4 Apparatus

The test shall be carried out with the aid of a tensile tester capable of measuring the specified elongation with an accuracy of 1 %.

The pulling speed shall be (50 ± 10) mm/min.

The initial length of the test specimen between the joints shall be (250 ± 5) mm.

A sufficient preload shall be applied onto the sample in order to tighten it before starting tensile strength and elongation measurement.

These samples shall be firmly gripped and pulled without jerking.

NOTE 1 The jaws or grips must be designed to produce a break in the middle of the test specimen.

NOTE 2 The jaws or grips' weight must not disrupt the measurement.

prEN 3475-505:2020 (E)**5 Method****5.1 Stranded conductor**

Measure 3 (three) strands per size, taken from the complete conductor except for:

- copper alloy sizes 0,15 mm² and 0,25 mm²; and
- aluminium or copper clad aluminium from size 0,2 mm² to 5 mm²;

where the whole conductor shall be pulled.

For cross-sections > 9 mm², measurement of elongation and tensile strength shall be applied on each stranding layer (inner intermediate and outer) during qualification only.

For cross-sections < 9 mm²: to clarify (tbd) if measurement (tensile and elongation) shall be on conductor or strand to be taken from the conductor.

5.2 Strand or solid conductor

Measure 3 (three) samples per size.

Report values of the elongation and tensile strength at the first strand breaking.

5.3 Braid

For tensile strength of braids, see Annex A (normative).

Report values of the elongation and tensile strength at the first strand breaking.

6 Requirements

The values for elongation at break, tensile strength at break and elastic limit (when required) shall conform to those given in the product standard.

Annex A (normative)

Test method: Braid strength measured after separation from finished cable

A.1 General

The cable jacket is carefully stripped on a length of about 500 mm without any damage to the shield(s) strands.

Then, the braid(s) is fully pulled off from these 3 (three) samples.

Each of 3 (three) of these samples is firmly gripped and pulled without jerking. The recommended test equipment is shown in Figure A.1.

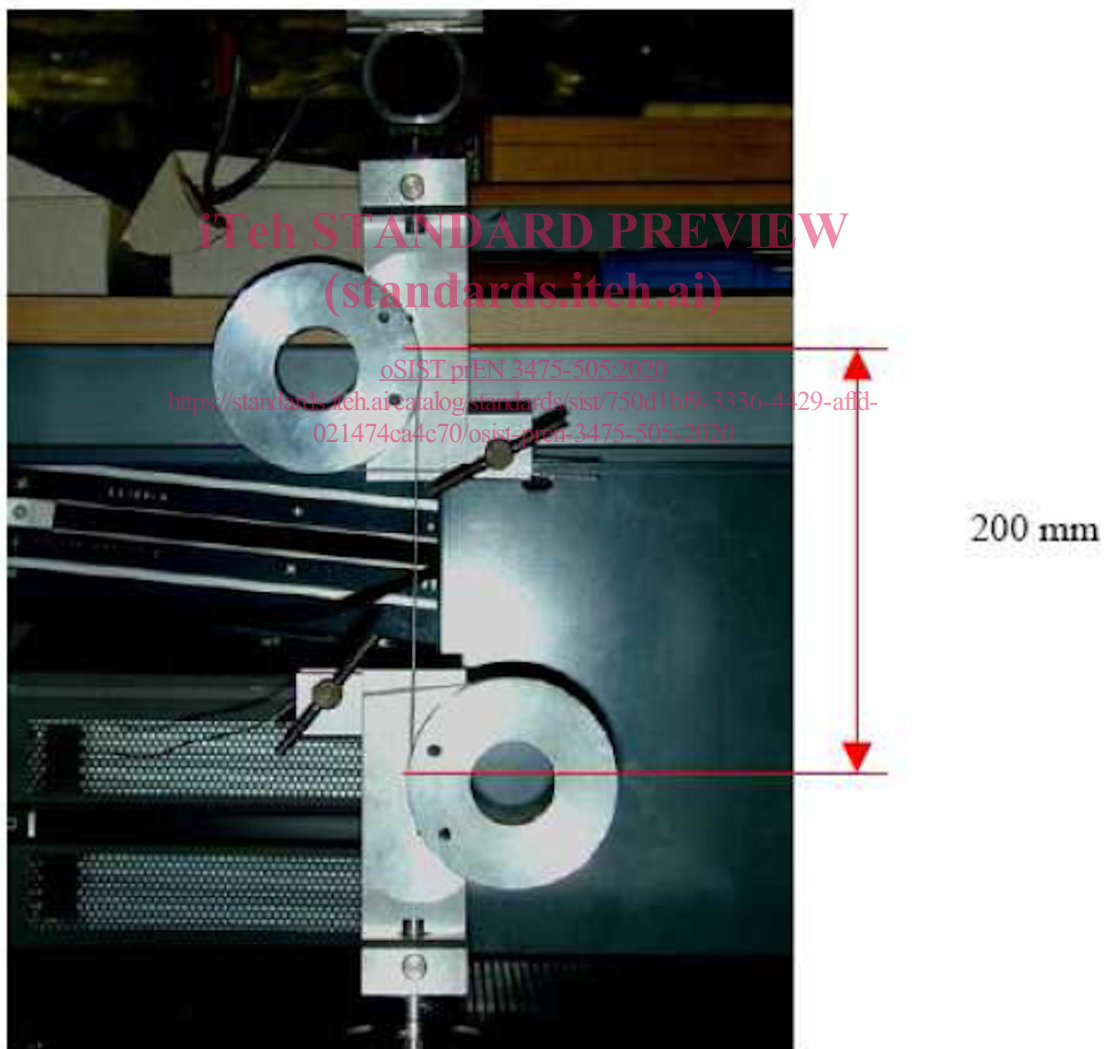


Figure A.1

The applied tensile force shall be monitored and recorded. Report values of the tensile strength at the first strand break. Calculate the average values S_1 from the 3 (three) measurements.

The tensile strength at break of the braid(s) is S_1 .

Bibliography

EN 3475-100, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 100: General*

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