
Aeronavtika - Kovinski materiali - Preskusne metode - 2. del: Natezni preskus pri povišani temperaturi

Aerospace series - Metallic materials - Test methods - Part 2: Tensile testing at elevated temperature

Luft- und Raumfahrt - Metallische Werkstoffe - Prüfverfahren - Teil 002: Zugversuch bei Hochtemperatur

Série aérospatiale - Matériaux métalliques - Méthodes d'essais applicables - Partie 2 : Essais de traction à température élevée

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49.025.15	Neželezove zlitine na splošno	Non-ferrous alloys in general

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Aerospace series - Metallic materials - Test methods - Part 2: Tensile testing at elevated temperature

Série aérospatiale - Matériaux métalliques - Méthodes
d'essais - Partie 002 : Essais de traction à température
élevée

Luft- und Raumfahrt - Metallische Werkstoffe -
Prüfverfahren - Teil 002: Zugversuch bei
Hochtemperatur

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European foreword

This document (EN 2002-002:2026) has been prepared by ASD-STAN.

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

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2026, and conflicting national standards shall be withdrawn at the latest by October 2026.

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 2002-002:2005.

EN 2002-002:2026 includes the following significant technical changes with respect to EN 2002-002:2005-11:

— general editorial improvements.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this document: 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, Türkiye and the United Kingdom.

EN 2002-002:2026 (E)**Introduction**

This document is part of the series of EN metallic material standards for aerospace applications. The general organization of this series is described in EN 4258.

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1 Scope

This document is applicable to the tensile testing and specifies the requirements of metallic materials at elevated temperature for aerospace applications.

It is applied when referred to in the EN technical specification or material standard unless otherwise specified on the drawing, order or inspection schedule.

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.

EN 4259, *Aerospace series — Metallic materials — Definition of general terms*

EN 60584-1, *Thermocouples — Part 1: EMF specifications and tolerances*

EN 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 7500-1)*

EN ISO 9513, *Metallic materials — Calibration of extensometer systems used in uniaxial testing (ISO 9513)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4259 and the following apply.

ISO and IEC maintain terminology 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/>

3.1

test piece

portion of the test sample on which the tensile test is carried out

3.2

proportional test piece

test piece with an original gauge length (L_0) having a specified relationship to the square root of the cross-sectional area (S_0)

Note 1 to entry: The proportionality coefficient, K , has the internationally recognized value of 5,65 for test pieces of circular cross-section. The gauge length of a proportional test piece is therefore equal to $5,65\sqrt{S_0}$. Certain material standards use proportional test pieces with other than the 5,65 proportionality coefficients. In this case, see A_x for the percentage elongation symbol used.

3.3

non-proportional test piece

test piece where the original gauge length is independent of the cross-sectional area

EN 2002-002:2026 (E)**3.4
extension**

increase of the extensometer gauge length (L_e) at any moment during the test

Note 1 to entry: The unit is mm.

**3.5
limit of proportionality**

stress at which the stress-strain (or force-extension) relationship deviates from a straight line

Note 1 to entry: The unit is MPa.

**3.6
percentage elongation**

A
<proportional test piece> elongation after fracture expressed as a percentage of the original gauge length (L_0) for a proportional test piece with an original gauge length of $L_0 = 5,65\sqrt{S_0}$

Note 1 to entry: For non-standard proportional test piece, see A_x .

Note 2 to entry: $A = \frac{L_u - L_0}{L_0} \times 100$.

Note 3 to entry: The unit is %.

**3.7
percentage elongation**

A_{L0}
<non-proportional test piece> elongation after fracture expressed as a percentage of the original gauge length (L_0) for a non-proportional test piece with an original gauge length of L_0

Note 1 to entry: For a non-proportional test piece, the original gauge length is given in millimetres, e.g. $A_{50\text{mm}}$.

Note 2 to entry: $A_{L0} = \frac{L_u - L_0}{L_0} \times 100$.

Note 3 to entry: The unit is %.

**3.8
percentage elongation**

A_x
<non-standard proportional test piece> elongation after fracture expressed as a percentage of the original gauge length (L_0) for a non-standard proportional test piece with an original gauge length of $L_0 = x$

EXAMPLE $L_0 = A_{4D}$

Note 1 to entry: A non-standard proportional test piece is one in which the proportionality coefficient has a value other than 5,65. In the example above the gauge length is four times the diameter, equivalent to a proportionality coefficient of 4,51.

Note 2 to entry: The unit is %.

3.9**test piece thickness*****a***

thickness of a test piece of rectangular cross-section or wall thickness of a tube

Note 1 to entry: The unit is mm.

3.10**test piece width*****b***

width of test pieces of rectangular cross-section, average width of the longitudinal strip taken from a tube or width of a flat wire

Note 1 to entry: The unit is mm.

3.11**tube external diameter*****D***

external diameter of a tube

Note 1 to entry: The unit is mm.

3.12**test piece diameter*****d***

diameter of the parallel length of a circular test piece or diameter of round wire or internal diameter of a tube

Note 1 to entry: The unit is mm.

3.13**Young's modulus of elasticity*****E***

value of the increment in stress divided by the corresponding increment in strain for the straight portion of the stress-strain (or force-extension) diagram

Note 1 to entry: The unit is GPa.

3.14**maximum force*****F_m***

greatest force which the test piece withstands during the test

Note 1 to entry: The unit is N.

3.15**gauge length*****L***

length of the cylindrical or prismatic portion of the test piece on which elongation is measured

Note 1 to entry: The unit is mm.