



SLOVENSKI STANDARD
oSIST prEN ISO 7500-1:2014
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Kovinski materiali - Preverjanje statičnih enoosnih preskuševalnih strojev - 1. del: Preskuševalni stroji za natezni/tlačni preskus - Preverjanje in umerjanje sistema za merjenje sile (ISO/DIS 7500-1:2014)

Metallic materials - Verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Verification and calibration of the force-measuring system (ISO/DIS 7500-1:2014)

Metallische Werkstoffe - Prüfung von statischen einachsigen Prüfmaschinen - Teil 1: Zug- und Druckprüfmaschinen - Prüfung und Kalibrierung der Kraftmesseinrichtung (ISO/DIS 7500-1:2014)

Matériaux métalliques - Vérification des machines pour essais statiques uniaxiaux - Partie 1: Machines d'essai de traction/compression - Vérification et étalonnage du système de mesure de force (ISO/DIS 7500-1:2014)

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Metallic materials — Verification of static uniaxial testing machines —

Part 1:

Tension/compression testing machines — Verification and calibration of the force-measuring system

*Matériaux métalliques — Vérification des machines pour essais statiques uniaxiaux —**Partie 1: Machines d'essai de traction/compression — Vérification et étalonnage du système de mesure de force*

[Revision of third edition (ISO 7500-1:2004) and ISO 7500-1:2004/Cor 1:2008]

ICS: 77.040.10

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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ISO/DIS 7500-112

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 7500-1 was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 1, *Uniaxial testing*.

This fourth edition cancels and replaces the third edition (ISO 7500-1:2004/Cor.1:2008), which has been technically revised.

ISO 7500 consists of the following parts, under the general title *Metallic materials — Verification of static uniaxial testing machines* —:

- *Part 1: Tension/compression testing machines -- Verification and calibration of the force-measuring system*
- *Part 2: Tension creep testing machines — Verification of the applied load*

Metallic materials — Verification of static uniaxial testing machines —

Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system

1 Scope

This part of ISO 7500 specifies the verification of tension/compression testing machines.

The verification consists of

- a general inspection of the testing machine, including its accessories for the force application;
- a calibration of the force-measuring system.

NOTE This part of ISO 7500 addresses the static verification of the force-measuring systems. The calibration values are not necessarily valid for high-speed or dynamic testing applications. Further information regarding dynamic effects is given in the Bibliography.

CAUTION - Some of the tests specified in this standard involve the use of processes which could lead to a hazardous situation.

2 Normative references

The following document, in whole or in part, is normatively referenced in this document and is 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 376, *Metallic materials — Calibration of force-proving instruments used for the verification of uniaxial testing machines*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

calibration

operation that establishes the relationship between the force values (with associated uncertainties) indicated by the testing machine and those measured by one or more force-proving instruments

3.2

verification

confirmation, based on analysis of measurements made during the calibration, that the performance properties of the testing machine achieve the limits given for a specified class

4 Symbols and their meanings

Symbols and their meanings are given in Table 1.

Table 1 — Symbols and their meanings

Symbol	Unit	Meaning
a	%	Relative resolution of the force indicator of the testing machine
a_F	%	Relative resolution of the force indicator of the testing machine at the applied force
a_Z	%	Relative resolution of the force indicator of the testing machine at zero force
b	%	Relative repeatability error of the force-measuring system of the testing machine
b_{al}	%	Allowable value of b for a given class
ΔF	N	Relative error of the force
Δm	kg	Relative error of the mass
Δg_n	m/s ²	Relative error of the acceleration due to gravity
E	%	Estimated mean relative error
E'	%	Estimated mean relative reversibility error
f_0	%	Relative zero error of the force-measuring system of the testing machine
F	N	True force indicated by the force-proving instrument with increasing test force
F'	N	True force indicated by the force-proving instrument with decreasing test force
F_c	N	True force indicated by the force-proving instrument with increasing test force, for the complementary series of measurements for the smallest range used
F_i	N	Force indicated by the force indicator of the testing machine to be verified, with increasing test force
$F_{i\Box}$	N	Force indicated by the force indicator of the testing machine to be verified, with decreasing test force
$\overline{F_i}, \overline{F}$	N	Arithmetic mean of several measurements of F_i and F for the same discrete force
F_{ic}	N	Force reading on the force indicator of the testing machine to be verified, with increasing test force, for the complementary series of measurements for the smallest range used
F_{i0}	N	Residual indication of the force indicator of the testing machine to be verified after removal of force
F_N	N	Maximum capacity of the measuring range of the force indicator of the testing machine
g_n	m/s ²	Local acceleration due to gravity
k		Coverage factor used to calculate the expanded uncertainty from the combined uncertainty
m	kg	Mass of dead weights used to generate a calibration force
q	%	Relative accuracy error of the force-measuring system of the testing machine
q_i	%	Relative accuracy error of the force-measuring system of the testing machine
q_{al}	%	Allowable value of q for a given class
q_{max}	%	The maximum value of q at each calibration point
q_{min}	%	The minimum value of q at each calibration point
q_{T1}	%	Relative accuracy determined at a crossover point using force-proving instrument 1
q_{T2}	%	Relative accuracy determined at a crossover point using force-proving instrument 2
r	N	Resolution of the force indicator of the testing machine