

Metallic materials — Verification of static uniaxial testing machines —

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

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National foreword

This British Standard is the UK implementation of EN ISO 7500-1:2004. It is identical with ISO 7500-1:2004, incorporating corrigendum June 2008. It supersedes BS EN ISO 7500-1:1999 which is withdrawn.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by ISO corrigendum June 2008 is indicated in the text by AC1 AC1.

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A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Foreword

This document (EN ISO 7500-1:2004) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 1 "Steel - Mechanical testing", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.

This document supersedes EN ISO 7500-1:1999.

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Endorsement notice

The text of ISO 7500-1:2004 has been approved by CEN as EN ISO 7500-1:2004 without any modifications.

Contents

Page

1	Scope.....	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols and their meanings	2
5	General inspection of the testing machine	2
6	Calibration of the force-measuring system of the testing machine	3
6.1	General	3
6.2	Determination of the resolution.....	3
6.3	Prior determination of the relative resolution of the force indicator.....	4
6.4	Calibration procedure.....	4
6.5	Assessment of the force indicator	7
7	Class of testing machine range	8
8	Verification report	8
8.1	General	8
8.2	General information	8
8.3	Results of verification.....	9
9	Intervals between verifications.....	9
Annex A (normative)	General inspection of the testing machine	10
Annex B (informative)	Inspection of the loading platens of the compression testing machines	11
Annex C (informative)	Alternative method of testing machine classification.....	12
Annex D (informative)	Uncertainty of the calibration results of the force-measuring system.....	13
Bibliography		17

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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.

2 Normative references

The following referenced documents are indispensable for the application 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 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 term and definition apply.

3.1

calibration

set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards

See VIM^[1].

NOTE 1 The result of a calibration permits either the assignment of values of measurands to the indications or the determination of corrections with respect to indications.

NOTE 2 A calibration may also determine other metrological properties such as the effect of influence quantities.

NOTE 3 The result of a calibration may be recorded in a document, sometimes called a calibration certificate or a calibration report.

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
b	%	Relative repeatability error of the force-measuring system of the testing machine
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	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
$F_{i \max}, F_{i \min}$	N	Highest or lowest value of F_i or F for the same discrete force
$F_{\max}, F_{\min}$		
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
q	%	Relative accuracy error of the force-measuring system of the testing machine
r	N	Resolution of the force indicator of the testing machine
v	%	Relative reversibility error of the force-measuring system of the testing machine
ρ_{air}	kg/m ³	Density of air
ρ_m	kg/m ³	Density of the dead weights

5 General inspection of the testing machine

The verification of the testing machine shall only be carried out if the machine is in good working order. For this purpose, a general inspection of the machine shall be carried out before calibration of the force-measuring system of the machine (see Annex A).

NOTE Good metrological practice requires a calibration run prior to any maintenance or adjustments to the testing machine.