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**Welding — Calibration, verification and
validation of equipment used for welding,
including ancillary activities**

*Soudage — Étalonnage, vérification et validation du matériel utilisé
pour le soudage, y compris pour les procédés connexes*



Reference number
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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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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 17662 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Unification of requirements in the field of metal welding*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read “this European Standard...” to mean “...this International Standard...”.

Annex ZA provides a list of corresponding International and European Standards for which equivalents are not given in the text.

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Foreword

This document (EN ISO 17662:2005) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 44 "Welding and allied processes".

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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This standard specifies requirements to calibration, verification and validation of equipment used for:

– control of process variables during fabrication,
or

– control of the properties of equipment used for welding or welding allied processes, where the resulting output cannot be readily or economically documented by subsequent monitoring, inspection and testing. This regards process variables influencing the fitness-for-purpose and in particular the safety of the fabricated product.

NOTE 1 The standard is based on the lists of process variables stated in standards for specification of welding procedures, in particular, but not exclusively, on the EN ISO 15609 series of standards. Future revisions of these standards can result in addition or deletion of parameters considered necessary to specify.

Some guidance is, in addition, given in annex B as regards requirements to calibration; verification and validation as part of acceptance testing of equipment used for welding or allied processes.

Requirements to calibration, verification and validation as part of inspection, testing, non-destructive testing or measuring of final welded products performed in order to verify product compliance are outside the scope of the present standard.

The subject of the standard is limited to calibration, verification and validation of equipment after installation, as part of the workshops' schemes for maintenance and/or operation.

NOTE 2 It should be stressed that the standard has nothing to do with manufacture and installation of equipment for welding. Requirements to new equipment are formulated in directives and product codes (standards), as necessary.

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.

EN 562, *Gas welding equipment — Pressure gauges used in welding, cutting and allied processes*

EN 729-1, *Quality requirements for welding — Fusion welding of metallic materials — Part 1: Guidelines for selection and use*

EN 729-2, *Quality requirements for welding — Fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

EN 729-3, *Quality requirements for welding — Fusion welding of metallic materials — Part 3: Standard quality requirements*

EN 729-4, *Quality requirements for welding — Fusion welding of metallic materials — Part 4: Elementary quality requirements*

EN 970, *Non-destructive examination of fusion welds — Visual examination*

EN 1321, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*

CR 12361, *Destructive tests on welds in metallic materials — Etchants for macroscopic and microscopic examination*

EN 13134, *Brazing — Procedure approval*

ENV 50184, *Validation of arc welding equipment*

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EN ISO 14554-1, *Quality requirements for welding — Resistance welding of metallic materials — Part 1: Comprehensive quality requirements (ISO 14554-1:2000)*

EN ISO 14554-2, *Quality requirements for welding — Resistance welding of metallic materials — Part 2: Elementary quality requirements (ISO 14554-2:2000)*

EN ISO 14555, *Welding — Arc stud welding of metallic materials (ISO 14555:1998)*

EN ISO 14744-5, *Welding — Acceptance inspection of electron beam welding machines — Part 5: Measurement of run-out accuracy (ISO 14744-5:2000)*

EN ISO 15609-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1:2004)*

EN ISO 15609-2, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 2: Gas welding (ISO 15609-2:2001)*

EN ISO 15609-3, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 3: Electron beam welding (ISO 15609-3:2004)*

EN ISO 15609-4, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 4: Laser beam welding (ISO 15609-4:2004)*

EN ISO 15609-5, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 5: Resistance welding (ISO 15609-5:2004)*

EN ISO 15620, *Welding — Friction welding of metallic materials (ISO 15620:2000)*

ISO 669, *Resistance welding — Resistance welding equipment — Mechanical and electrical requirements*

3 Terms and definitions

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

3.1

accuracy class

class of measuring instruments that meet certain metrological requirements that are intended to keep errors within specified limits

[1]

3.2

accuracy of measurand

closeness of the agreement between the result of a measurement and a true value of the measurement

[1]

3.3

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

[1]

3.4

measurement

set of operations having the object of determining a value of a quantity

[1]

3.5

measuring instrument

device intended to be used to make measurements, alone or in conjunction with supplementary device(s)

[1]