INTERNATIONAL STANDARD

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Second edition
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Non-destructive testing of welds — General rules for metallic materials

Contrôle non destructif des assemblages soudés — Règles générales pour les matériaux métalliques

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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 17635 was prepared by the European Committee for Standardization (CEN) Technical Committee TC 121, *Welding*, in collaboration with Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 5, *Testing and inspection of welds*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 17635:2003), which has been technically revised.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 5 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Non-destructive testing of welds — General rules for metallic materials

1 Scope

This International Standard gives guidelines for the choice of non-destructive testing (NDT) methods for welds and evaluation of the results for quality control purposes, based on quality requirements, material, weld thickness, welding process, and extent of testing.

This International Standard also specifies general rules and standards to be applied to the different types of testing, for either the methodology or the acceptance level for metallic materials.

Acceptance levels cannot be a direct interpretation of the quality levels defined in ISO 5817 or ISO 10042. They are linked to the overall quality of the produced batch of welds.

Requirements for acceptance levels for NDT comply with quality levels stated in ISO 5817 or ISO 10042 (moderate, intermediate, stringent) only on a general basis and not in detail for each indication.

Annex A gives correlations between quality, NDT and acceptance level standards.

Annex B gives an overview of the standards linked to quality levels, acceptance levels, and NDT methods.

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 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 10042, *Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections*

ISO 10675-1, *Non-destructive testing of welds — Acceptance levels for radiographic testing — Part 1: Steel, nickel, titanium and their alloys*

ISO 10675-2, *Non-destructive testing of welds — Acceptance levels for radiographic testing — Part 2: Aluminium and its alloys*

ISO 10863[1)], *Welding — Use of time-of-flight diffraction technique (TOFD) for testing of welds*

ISO 11666, *Non-destructive testing of welds — Ultrasonic testing of welded joints — Acceptance levels*

1) To be published.

ISO 17636, *Non-destructive testing of welds — Radiographic testing of fusion-welded joints*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

ISO 17638, *Non-destructive testing of welds — Magnetic particle testing*

ISO 17640, *Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment*

ISO 17643, *Non-destructive testing of welds — Eddy current testing of welds by complex-plane analysis*

ISO 19232-5, *Non-destructive testing — Image quality of radiographs — Part 5: Image quality indicators (duplex wire type) — Determination of image unsharpness value*

ISO 23277, *Non-destructive testing of welds — Penetrant testing of welds — Acceptance levels*

ISO 23278, *Non-destructive testing of welds — Magnetic particle testing of welds — Acceptance levels*

ISO 23279, *Non-destructive testing of welds — Ultrasonic testing — Characterization of indications in welds*

EN 473, *Non-destructive testing — Qualification and certification of NDT personnel — General principles*

EN 13068-3, *Non-destructive testing — Radioscopic testing — Part 3: General principles of radioscopic testing of metallic materials by X- and gamma rays*

EN 14784-2, *Non-destructive testing — Industrial computed radiography with storage phosphor imaging plates — Part 2: General principles for testing of metallic materials using X-rays and gamma rays*

EN 15617, *Non-destructive testing of welds —Time-of-flight diffraction technique (TOFD) — Acceptance levels*

3 Terms and definitions

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

3.1
testing level
degree of thoroughness and selection of parameter settings with which a testing method is applied

[ISO/TR 25901:2007 [2], 2.376]

NOTE Different levels correspond to different sensitivities and/or probabilities of detection. The selection of testing levels is normally related to the quality requirements.

3.2
testing organization
internal or external organization carrying out non-destructive testing

NOTE Adapted from ISO/TR 25901:2007 [2], 2.377.

3.3
indication
⟨non-destructive testing⟩ representation or signal from a discontinuity in the format allowed by the non-destructive testing method used

NOTE Adapted from ISO/TR 25901:2007 [2], 2.193.

3.4
internal discontinuity
⟨non-destructive testing of welds⟩ discontinuity that is not open to a surface or not directly accessible

