



**SLOVENSKI STANDARD**  
**oSIST prEN ISO 17635:2024**  
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**Neporušitveno preskušanje zvarnih spojev - Splošna pravila za kovinske materiale (ISO/DIS 17635:2023)**

Non-destructive testing of welds - General rules for metallic materials (ISO/DIS 17635:2023)

Zerstörungsfreie Prüfung von Schweißverbindungen - Allgemeine Regeln für metallische Werkstoffe (ISO/DIS 17635:2023)

Essais non destructifs des assemblages soudés - Règles générales pour les matériaux métalliques (ISO/DIS 17635:2023)

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25.160.40      Varjeni spoji in vari      Welded joints and welds

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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*

ICS: 25.160.40

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# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Abbreviated terms</b> .....	<b>3</b>
<b>5 Limitations</b> .....	<b>3</b>
5.1 Stage of manufacture.....	3
5.2 Extent of testing.....	4
5.3 Materials.....	4
<b>6 Personnel qualification</b> .....	<b>4</b>
<b>7 Testing organization</b> .....	<b>4</b>
<b>8 Documentation</b> .....	<b>4</b>
8.1 Documentation prior to testing.....	4
8.1.1 General.....	4
8.1.2 Written procedures.....	4
8.1.3 Testing plan.....	4
8.2 Documentation after testing.....	5
8.2.1 Records of individual testing.....	5
8.2.2 Final test report.....	5
<b>9 Selection of testing method</b> .....	<b>5</b>
9.1 General.....	5
9.2 Butt- and T-joints with full penetration.....	6
9.3 Butt- and T-joints without full penetration and fillet welds.....	6
<b>10 Performance of testing</b> .....	<b>7</b>
10.1 Determination of standards to be applied.....	7
10.2 Conditions for testing.....	7
10.3 Time of testing.....	7
10.4 Non-acceptable indications.....	7
10.5 Repaired welds.....	7
<b>Annex A (normative) Rules and standards to be applied</b> .....	<b>8</b>
<b>Annex B (informative) Graphs of standard context</b> .....	<b>12</b>
<b>Bibliography</b> .....	<b>14</b>

## ISO/DIS 17635:2023(E)

### 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 5, *Testing and inspection of welds*.

This fourth edition cancels and replaces the third edition (ISO 17635:2016), which has been technically revised.

The main changes are as follows:

- references updated;
- Phased-array ultrasonic technique (UT-PA) for thin-walled steel components added;
- Total focusing technique (TFM) added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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

## 1 Scope

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

This document also specifies general rules and standards to be applied to the different types of testing, for the selection of the method, the techniques and the acceptance levels.

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 levels, testing levels and acceptance levels for specific testing techniques.

[Annex B](#) gives an overview of the standards linked to quality levels, acceptance levels and testing methods for specific testing techniques.

## 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.

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

ISO 4761, *Non-destructive testing of welds — Phased array ultrasonic testing (UT-PA) for thin-walled steel components — Acceptance levels*

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 NDT 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, *Non-destructive testing of welds — Ultrasonic testing — Use of time-of-flight diffraction technique (TOFD)*

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

ISO 13588, *Non-destructive testing of welds — Ultrasonic testing — Use of automated phased array technology*

## ISO/DIS 17635:2023(E)

ISO 15626, *Non-destructive testing of welds — Time-of-flight diffraction technique (TOFD) — Acceptance levels*

ISO 17636-1, *Non-destructive testing of welds — Radiographic testing — Part 1: X- and gamma-ray techniques with film*

ISO 17636-2, *Non-destructive testing of welds — Radiographic testing — Part 2: X- and gamma-ray techniques with digital detectors*

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 19285, *Non-destructive testing of welds — Phased array ultrasonic testing (PAUT) — Acceptance levels*

ISO 20601, *Non-destructive testing of welds — Ultrasonic testing — Use of automated phased array technology for thin-walled steel components*

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

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

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

ISO 23864, *Non-destructive testing of welds — Ultrasonic testing — Use of automated total focusing technique (TFM) and related technologies*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 testing level

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

[SOURCE: ISO/TR 25901-1:2016, 2.2.4.5, modified — “non-destructive” was deleted from the definition.]

Note 1 to entry: 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

[SOURCE: ISO/TR 25901-1:2016, 2.2.1.7, modified — “destructive testing” was deleted from the definition.]



### 3.3 indication

<non-destructive testing> representation or signal from a discontinuity in the format allowed by the non-destructive testing method used

[SOURCE: ISO/TR 25901-1:2016, 2.2.4.2, modified — “in the format allowed by the non-destructive testing method used” was added to the definition.]

### 3.4 internal discontinuity

<non-destructive testing of welds> discontinuity that is not open to a surface or not directly accessible

### 3.5 quality level

description of the quality of a weld on the basis of type, size and amount of specified imperfections

[SOURCE: ISO/TR 25901-1:2016, 2.5.17, modified: “selected” is replaced by “specified”]

## 4 Abbreviated terms

For the purposes of this document, the abbreviated terms given in [Table 1](#) apply.

**Table 1 — Abbreviated terms**

Term	Abbreviation
Eddy current testing	ET
Magnetic particle testing	MT
Penetrant testing	PT
Radiographic testing	RT
Radiographic testing using films	RT-F
Digital radiographic testing	RT-D
Digital radiographic testing using storage phosphor imaging plates	RT-D using CR
Radiographic testing using digital detector arrays	RT-D using DDA
Radioscopy	RT-S
Ultrasonic testing	UT
Ultrasonic testing using pulse-echo technique	UT-PE
Ultrasonic testing using time-of-flight diffraction technique	UT-TOFD
Ultrasonic testing using phased arrays	UT-PA
Ultrasonic testing using total focusing technique	UT-TFM
Visual testing	VT

## 5 Limitations

### 5.1 Stage of manufacture

This document has been prepared for the testing of completed welds (see [10.3](#)).

Testing of parent materials prior to welding or between welding sequences is not covered by this document.

## ISO/DIS 17635:2023(E)

It is, however, recommended that such testing be performed in accordance with the referenced testing standards and acceptance level standards.

### 5.2 Extent of testing

The extent of testing shall be given in an application standard or defined in a specification.

### 5.3 Materials

This document includes requirements for testing of fusion welds in the following materials, their alloys and their combinations:

- a) steel;
- b) aluminium;
- c) nickel;
- d) titanium.

The use of this document for other metallic materials, e. g. copper, shall be specified.

## 6 Personnel qualification

Personnel performing NDT and the evaluation of the results for final acceptance of welds shall be qualified in accordance with ISO 9712 or equivalent at an appropriate level in the relevant industrial sector.

## 7 Testing organization (<https://standards.iteh.ai>)

The testing organization shall be organized independently of the production and its activities shall be controlled by a quality management system.

## 8 Documentation

[oSIST prEN ISO 17635:2024](https://standards.iteh.ai/catalog/standards/sist/b0c2e000-3376-46d7-a77b-ff768b8e0224/osist-pren-iso-17635-2024)

<https://standards.iteh.ai/catalog/standards/sist/b0c2e000-3376-46d7-a77b-ff768b8e0224/osist-pren-iso-17635-2024>

### 8.1 Documentation prior to testing

#### 8.1.1 General

- a) Prior to testing, all necessary preliminary information required by the applicable testing standards shall be provided.
- b) The criteria for acceptable indications shall be given in the acceptance level standard or defined in a specification.

#### 8.1.2 Written procedures

All testing shall be performed in accordance with a written procedure as required by the applicable individual testing standard or as specified.

#### 8.1.3 Testing plan

It can be necessary to carry out additional testing including more than one NDT method or multiple testing techniques of one method.