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Specification and qualification of welding procedures for metallic materials — Welding procedure test —

Part 5: Arc welding of titanium, zirconium and their alloys

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques — Épreuve de qualification d'un mode opératoire de soudage —

Partie 5: Soudage à l'arc sur titane, zirconium et leurs alliages

Reference number
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Contents

Page

Foreword ..... **v**
Introduction ..... **vi**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **2**
4 Preliminary welding procedure specification (pWPS) **2**
5 Welding procedure test **2**
6 Test pieces **2**
6.1 General 2
6.2 Shape and dimensions of test pieces 2
6.2.1 General 2
6.2.2 Butt joint in plate with full penetration 3
6.2.3 Butt joint in pipe with full penetration 3
6.2.4 T-joint 3
6.2.5 Branch connection 3
6.3 Welding of test pieces 3
7 Examination and testing **6**
7.1 Extent of testing 6
7.2 Location and taking of test specimens 7
7.3 Non-destructive testing 11
7.4 Destructive testing 11
7.4.1 General 11
7.4.2 Transverse tensile test 11
7.4.3 Bend test 11
7.4.4 Macroscopic or microscopic examination 11
7.5 Acceptance levels 12
7.6 Coloration 12
7.7 Retesting 12
8 Qualification range **12**
8.1 General 12
8.2 Requirements related to the manufacturer 12
8.3 Requirements related to the parent material 12
8.3.1 Parent material grouping 12
8.3.2 Material thickness and pipe diameter 13
8.3.3 Angle of branch connection 14
8.4 Requirements common to all welding procedures 14
8.4.1 Welding process 14
8.4.2 Welding positions 15
8.4.3 Type of joint and weld 15
8.4.4 Filler material, designation 15
8.4.5 Type of current 15
8.4.6 Interpass temperature 15
8.4.7 Post-weld heat treatment 15
8.4.8 Backing gas 16
8.4.9 Welding in a chamber 16
8.5 Requirements specific to welding processes 16
8.5.1 Process 131 16
8.5.2 Process 14 16
8.5.3 Process 15 16
9 Welding procedure qualification record (WPQR) **16**
Annex A (informative) **Example of a welding procedure qualification record (WPQR)** **17**

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Bibliography **20**

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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.

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 document 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).

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This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Quality management in the field of welding*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding and allied processes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15614-5:2004), which has been technically revised.

The main changes are as follows:

— normative references updated;

— Table 2 and Table 3 revised using the same format as ISO 15614-1;

— reference to EN 439 replaced with ISO 14175;

— process numbers updated in accordance with ISO 4063;

— Annex A updated.

A list of all parts in the ISO 15614 series can be found on the ISO website.

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. Official interpretations of ISO/TC 44 documents, where they exist, are available from this page: https://committee.iso.org/sites/tc44/home/interpretation.html.

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Introduction

All new welding procedure tests are intended to be carried out in accordance with this document. However, this document does not invalidate previous welding procedure tests made to former national standards or specifications or the previous edition of this document.

Where additional tests have to be carried out to make a qualification technically equivalent, these should be done on a test piece which is made in accordance with this document.

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Specification and qualification of welding procedures for metallic materials — Welding procedure test —

Part 5:
Arc welding of titanium, zirconium and their alloys

1 Scope

This document specifies how a preliminary welding procedure specification (pWPS) is qualified by welding procedure tests.

This document specifies the conditions for the execution of welding procedure tests and the qualification range for welding procedures for all practical welding operations within the range of variables listed in Clause 8.

This document specifies the required tests. Additional tests can be required by application standards.

This document applies to the arc welding of titanium, zirconium and their alloys in all product forms. Arc welding is covered by the following processes in accordance with ISO 4063:

131 – metal inert gas welding, MIG welding;

14 – tungsten inert gas welding, TIG welding;

15 – plasma arc welding.

The principles of this document can be applied to other fusion welding processes.

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 4136, *Destructive tests on welds in metallic materials — Transverse tensile test*

ISO 5173, *Destructive tests on welds in metallic materials — Bend tests*

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

ISO 6947, *Welding and allied processes — Welding positions*

ISO 9606-5, *Approval testing of welders — Fusion welding — Part 5: Titanium and titanium alloys, zirconium and zirconium alloys*

ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes*

ISO 14732, *Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials*

ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

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