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

**Part 7:
Overlay welding**

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

Partie 7: Rechargement par soudage



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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 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).

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).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Quality management in the field of welding*.

This second edition cancels and replaces the first edition (ISO 15614-7:2007), which has been technically revised.

ISO 15614 consists of the following parts, under the general title *Specification and qualification of welding procedures for metallic materials — Welding procedure test*:

- *Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*
- *Part 2: Arc welding of aluminium and its alloys*
- *Part 3: Fusion welding of non-alloyed and low-alloyed cast irons*
- *Part 4: Finishing welding of aluminium castings*
- *Part 5: Arc welding of titanium, zirconium and their alloys*
- *Part 6: Arc and gas welding of copper and its alloys*
- *Part 7: Overlay welding*
- *Part 8: Welding of tubes to tube-plate joints*
- *Part 10: Hyperbaric dry welding*
- *Part 11: Electron and laser beam welding*
- *Part 12: Spot, seam and projection welding*
- *Part 13: Upset (resistance butt) and flash welding*
- *Part 14: Laser-arc hybrid welding of steels, nickel and nickel alloys*

Requests for official interpretations of any aspect of this part of ISO 15614 should be directed to the secretariat of ISO/TC 44/SC 10 via your national standards body, a complete listing which can be found at www.iso.org.

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Introduction

This part of ISO 15614 is one of a series of International Standards, the details of which are given in ISO 15607:2003, Annex A.

All new welding procedure tests are intended to be carried out in accordance with this edition of ISO 15614-7 from the date of its publication. However, qualifications performed in accordance with the previous editions of this part of ISO 15614 are still valid and it is not considered necessary to perform additional tests to fulfil its requirements for any application with reference to previous editions. Nevertheless, in order to comply with the requirements of the present edition it may be necessary to perform additional tests for previously qualified WPS.

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

Part 7: Overlay welding

1 Scope

This part of ISO 15614 specifies how a preliminary welding procedure specification for overlay welding is qualified by welding procedure tests.

This part of ISO 15614 defines the conditions for execution of welding procedure tests and the range of qualification for welding procedures for all practical welding operations within the range of variables listed in [Clause 8](#).

This part of ISO 15614 applies to all welding processes suitable for overlay welding. In situations where qualification is carried out on a pre-production test piece, the qualification is performed in accordance with ISO 15613 except that, as far as possible, the testing is according to this part of ISO 15614. Building up and repair of parent metal is covered by ISO 15613 or ISO 15614-1.

This edition of ISO 15614-7 is applicable to all new welding procedure qualification tests. It does not invalidate previous welding procedure tests made in accordance with previous editions of this part of ISO 15614. Where additional tests are required by the present edition, it is only necessary that those additional tests be carried out on a test piece made in accordance with the existing WPS and this part of ISO 15614.

If buttering is used for welding between dissimilar materials, the welding procedure is qualified in accordance with ISO 15614-1. This buttering may be required for weld combining different material structure or properties, e.g. joining martensitic steels or ferritic steels with austenitic steels.

Additional tests may be required by application standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 5173, *Destructive tests on welds in metallic materials — Bend tests*

ISO 9015-1, *Destructive tests on welds in metallic materials — Hardness testing — Part 1: Hardness test on arc welded joints*

ISO 13916, *Welding — Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

ISO 14174, *Welding consumables — Fluxes for submerged arc welding and electroslag welding — Classification*

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

ISO 15607:2003, *Specification and qualification of welding procedures for metallic materials — General rules*

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

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

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

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

ISO 15613, *Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test*

ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO 17405, *Non-destructive testing — Ultrasonic testing — Technique of testing claddings produced by welding, rolling and explosion*

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

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

ISO 17639, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*

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

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

ISO/TR 15608, *Welding — Guidelines for a metallic materials grouping system*

ISO/TR 18491, *Welding and allied processes — Guidelines for measurement of welding energies*

ISO/TR 25901 (all parts), *Welding and related processes — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15607, ISO/TR 25901 and the following apply.

3.1

overlay welding

surfacing by means of welding

3.2

cladding

material deposited on the parent metal in order to produce a clad material

3.3

cladding process

surfacing used for *cladding* ([3.2](#))

3.4

clad steel

combination of two or more dissimilar metals bonded inseparably together by a *cladding process* ([3.3](#))

3.5

buttering

overlay welding ([3.1](#)) to provide a suitable transition between the parent metal and subsequent weld