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

**Part 5:
Resistance welding**

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

Partie 5: Soudage par résistance

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Published in Switzerland

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 15614-12 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...”.

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 welding*
- *Part 2: Gas welding*
- *Part 3: Electron beam welding*
- *Part 4: Laser beam welding*
- *Part 5: Resistance welding*

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 15609-5:2004) 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 February 2005, and conflicting national standards shall be withdrawn at the latest by February 2005.

Annexes A, B and C are informative.

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.

NOTE Normative references to International Standards are listed in annex ZA (normative).

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Introduction

All new welding procedures issued and the procedure for their creation and qualification are to be in accordance with this standard for the date of its issue.

This standard does not, however, invalidate welding procedures and their qualification complying with then existing national or international standards or regulations, provided the intent of the technical requirement is satisfied and the specified application remains unchanged.

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1 Scope

This standard specifies requirements for the content of welding procedure specifications for resistance spot, seam, butt and projection welding processes. The acceptability of applying the principles of the standard to other resistance and related welding processes should be established before any qualification is undertaken.

This standard is part of a series of standards. Details of this series are given in EN ISO 15607:2003, annex A.

Variables listed in this standard are those influencing either weld dimensions (quality), weld nugget dimension, weld pattern positioning, mechanical properties or geometry of the welded joint.

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 ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers* (ISO 4063: 1998).

EN ISO 5183-1, *Resistance welding equipment - Electrode adaptors, male taper 1:10 - Part 1: Conical fixing, taper 1:10* (ISO 5183-1:1998)

EN ISO 5183-2, *Resistance spot welding — Electrode adaptors, male taper 1:10 — Part 2: Parallel shank fixing for end-thrust electrodes* (ISO 5183-2: 2000)

EN ISO 8205-1, *Water-cooled secondary connection cables for resistance welding — Part 1: Dimensions and requirements for double-conductor connection cables* (ISO 8205-1: 2002).

EN ISO 8205-2, *Water-cooled secondary connection cables for resistance welding — Part 2: Dimensions and requirements for single-conductor connection cables* (ISO 8205-2: 2002).

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

EN 25184, *Straight resistance spot welding electrodes* (ISO 5184: 1979).

EN 25821, *Resistance spot welding electrode caps* (ISO 5821: 1979).

EN 25827, *Spot welding — Electrode back-ups and clamps* (ISO 5827: 1983).

EN 28430-1, *Resistance spot welding — Electrode holders — Part 1: Taper fixing 1:10* (ISO 8430-1: 1988).

EN 28430-2, *Resistance spot welding — Electrode holders — Part 2: Morse taper fixing* (ISO 8430-2: 1988).

EN 28430-3, *Resistance spot welding — Electrode holders — Part 3: Parallel shank fixing for end thrust* (ISO 8430-3: 1988).

ISO 669:2000, *Resistance welding — Resistance welding equipment — Mechanical and electrical requirements*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 15607:2003 and ISO 669:2000 apply.

4 Technical contents of welding procedure specification (WPS)

4.1 General

The welding procedure specification (WPS) shall provide all the necessary information required to make a weld. The minimum information required in a WPS for resistance welding processes is listed in clause 4.2 to 4.4.

Welding procedure specifications shall apply to one specific application only, and the acceptability of expansion to cover similar applications shall be established before any qualification is undertaken.

For some applications it may be necessary to supplement the list. All relevant information shall be specified in the WPS.

Tolerance ranges shall be specified.

Examples of the WPS format are shown in annexes A, B and C; these forms should be modified according to actual practice.

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4.2 Related to manufacturer

- Identification of manufacturer;
- Identification of WPS; <https://standards.iteh.ai/catalog/standards/sist/b99ac012-e493-44cb-a7c4-3a489713e8f2/iso-15609-5-2004>
- Reference to the Welding Procedure Qualification Record (WPQR).

4.3 Related to parent material

4.3.1 Composition of parent material

- Designation of the material(s) and referenced standard(s);
- In case of anticorrosion coating (type, thickness, number of faces).

4.3.2 Dimension of parent material

- Thickness of material at the joint;
- Dimensions of cross-section of pipe or section (butt welding).

4.4 Common to all welding procedures

4.4.1 Welding process

- Welding process(es) specified shall be designated as listed in EN ISO 4063:
 - a) Spot welding (21):

- manual:
 - machine;
 - gun.
- multi:
 - direct;
 - indirect;
 - push-pull;
 - series.
- mechanized:
 - single stage;
 - transfer line;
 - automatic feed;
 - robotic.

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b) Seam welding (22) (Roller spot welding):

- manual/guided/automatic/robotic. [ISO 15609-5:2004](https://standards.iteh.ai/catalog/standards/sist/b99ac012-e493-44cb-a7c4-3a489713e8f2/iso-15609-5-2004)

c) Projection welding (23):

- single/multiple;
- embossed/solid.

d) Resistance butt welding (25):

- resistance/flash/capacitor discharge.

e) Weldbonding:

- manual/mechanized/robotic.

NOTE Numbers in accordance with EN ISO 4063.

4.4.2 Machine specification

Type of machine used and identification (serial number, plant number or nameplate in accordance with ISO 669).

4.4.3 Joint design

The overlap, edge conditions, spot weld pitch, sequence and pattern, spot or projection dimensions, which depend on the sheet thickness, shall be specified and shall comply with the appropriate standards, where applicable.