EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 15612

July 2018

ICS 25.160.10

Supersedes EN ISO 15612:2004

English Version

# Specification and qualification of welding procedures for metallic materials - Qualification by adoption of a standard welding procedure (ISO 15612:2018)

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Qualification par référence à un mode opératoire de soudage standard (ISO 15612:2018)

Anforderung und Qualifizierung von Schweißverfahren für metallische Werkstoffe - Qualifizierung durch Einsatz eines Standardschweißverfahrens (ISO 15612:2018)

This European Standard was approved by CEN on 24 June 2018.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels



Ref. No. EN ISO 15612:2018: E

# European foreword

This document (EN ISO 15612:2018) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 "Welding and allied processes" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by January 2019, and conflicting national standards shall be withdrawn at the latest by January 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 15612:2004.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**Endorsement notice**

The text of ISO 15612:2018 has been approved by CEN as EN ISO 15612:2018 without any modification.

# Contents

Page

# 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 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee 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 15612:2004), which has been technically revised. The main changes compared to the previous edition are as follows:

— the Introduction has been revised;

— clarification on how and when an SWPS may be used has been added throughout the document;

— limits on the use of SWPSs (Clause 4) have been updated.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 10 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

# Introduction

This document comprises part of a matrix of standards for the specification and qualification of welding procedures as given in ISO 15607. It permits a manufacturer to adopt a welding procedure specification qualified and published as a standard welding procedure specification (SWPS) by a different organization.

# Specification and qualification of welding procedures for metallic materials - Qualification by adoption of a standard welding procedure specification

## 1 Scope

This document:

— specifies how a user can follow a standard welding procedure specification (SWPS) based on welding procedure qualification tests performed by a different organization;

— specifies the range for the use of SWPSs in accordance with ISO 15607;

— specifies the requirements for qualification of welding procedures to be issued as SWPSs; and

— specifies the requirements for organizations adopting SWPSs.

The use of this document can be restricted by an application standard or a specification.

This document is applicable to welding of steels and aluminium and its alloys (see 4.1).

All new standard welding procedure qualifications are to be carried out in accordance with this document from the date of its issue. However, this document does not invalidate previous standard welding procedure qualifications made to former standards, specifications or previous editions of this document.

## 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 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

ISO 14731, *Welding coordination — Tasks and responsibilities*

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*

ISO 15609 (all parts), *Specification and qualification of welding procedures for metallic materials — Welding procedure specification*

ISO 15614 (all parts), *Specification and qualification of welding procedures for metallic materials — Welding procedure test*

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

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15607, ISO/TR 18491 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

**3.1**
**standard welding procedure specification**
**SWPS**
welding procedure specification qualified and issued by one organization for adoption by a user

**3.2**
**organization**
<SWPS> entity responsible for the development, qualification and publication of a *standard welding procedure specification (SWPS)* (3.1)

**3.3**
**user**
<SWPS> manufacturer that produces welded joints (shop or site) following an *SWPS* (3.1)

Note 1 to entry: The SWPS is one that has been adopted in accordance with Clause 5.

## 4 Limits on use of and publication of an SWPS

### 4.1 General

An SWPS shall be developed by an organization based on one or more Welding Procedure Qualification Records (WPQRs) qualified in accordance with ISO 15614-1 level 2 or ISO 15614-2.

SWPSs qualified to other standards may be used if they meet the technical requirements of ISO 15614-1 level 2 or ISO 15614-2.

The SWPS shall specify the ranges for all the relevant variables in accordance with the relevant part of ISO 15609.

The organization may specify additional requirements in an SWPS it believes are necessary to follow to ensure suitable production joint weld quality. For example:

— joint preparation method, details, and fit-up tolerances;

— restricted welding position(s);

— welding consumable, including manufacturer and trade name where impact testing is required;

— power source manufacturer and type;

— preheating and interpass temperature method and control (see ISO/TR 17671-1, ISO/TR 17671-2 and ISO 13916);

— repair welding.

### 4.2 Limits on the use of SWPSs

#### 4.2.1 General

SWPSs shall not exceed the requirements given in 4.2.2 and 4.2.3.

#### 4.2.2 Parent material thickness

SWPSs shall not be issued for material thickness over 50 mm.

#### 4.2.3 Parent material

This document is applicable to the ISO/TR 15608 parent material groups shown in Table 1.

**Table 1 — Applicable ISO/TR 15608 parent material groups**

| Steel | Aluminium and its alloys |
|---|---|
| 1.1, 1.2 and 1.3 | 21 |
| 11.1 | 22.1 |
| 8.1 | 22.2 |

Joints between dissimilar material groups are not permitted, except for:

— any combination between subgroup 1.1, 1.2 and 1.3 and subgroup 11.1;

— combinations between subgroup 22.1 and subgroup 22.2.

## 5 Adoption of an SWPS

### 5.1 General

The user shall implement welding coordination in accordance with ISO 14731.

Alternatively, the user shall qualify one welder or welding operator in accordance with ISO 9606-1, ISO 9606-2 or ISO 14732, or technically equivalent standards, following the SWPS to demonstrate a minimum level of competence in welding oversight within the user's organization. The welder's or welding operator's qualification certificate shall include the SWPS used for qualification.

### 5.2 Related to the user of an SWPS

**5.2.1** The user of an SWPS is responsible for the appropriate selection and application of the SWPS.

**5.2.2** The user of an SWPS shall enter their company name on the SWPS.

**5.2.3** Alternatively, the user may transfer the content of the SWPS, without modification (except as permitted by 5.2.5), to the layout used for WPSs in their company with reference back to the SWPS.

**5.2.4** A designated employee of the user or the user's welding coordinator shall sign and date the SWPS or WPS before it may be used in production.

**5.2.5** The following requirements apply when following the SWPS.

— The user shall not exceed the limits of the variables included in the SWPS.

— The user may further restrict the range of variables included in the SWPS, for example, if an SWPS allows use of several electrode sizes, supplemental instructions may direct the welder to use only one of the permitted sizes. The supplemental instructions may not permit the welder to use a size other than those allowed by the SWPS.

— SWPSs shall not be combined in the same joint with other SWPSs or WPSs qualified by the user.

— The user may supplement an SWPS with additional instructions to provide the welder with further direction for making production welds.

## 6 Validity

An SWPS remains valid indefinitely unless it is withdrawn or revised by the organization.

The organization publishing the SWPS and the user shall establish procedures to verify if an SWPS has been revised or withdrawn.

If an organization is purchased by another organization, the SWPS remains valid under the authority of the new organization.

## 7 Preparation and documentation

The SWPS shall be in accordance with the relevant part of ISO 15609. The WPQR on which the SWPS is based shall be available to the user. Any restrictions, e.g. equipment, consumables or environmental conditions that the organization determines are needed, shall be specified on the SWPS.

All records on which the SWPS is based shall be traceable to the organization that issued the SWPS during the entire period of its use.

# Bibliography

[1] ISO 13916, *Welding — Measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

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

[3] ISO/TR 17671-1, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*

[4] ISO/TR 17671-2, *Welding — Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*