

# SVENSK STANDARD

## SS-EN ISO 15614-12:2014



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### **Specifikation för och kvalificering av svetsprocedurer för metalliska material – Svetsprocedurkontroll – Del 12: Punkt-, söm- och presssvetsning (ISO 15614-12:2014)**

### **Specification and qualification of welding procedures for metallic materials – Welding procedure test – Part 12: Spot, seam and projection welding (ISO 15614-12:2014)**

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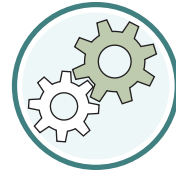
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Europastandarden EN ISO 15614-12:2014 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 15614-12:2014.

Denna standard ersätter SS-EN ISO 15614-12:2004, utgåva 1.

The European Standard EN ISO 15614-12:2014 has the status of a Swedish Standard. This document contains the official version of EN ISO 15614-12:2014.

This standard supersedes the Swedish Standard SS-EN ISO 15614-12:2004, edition 1.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 15614-12:2014/  
Relations to other parts under the same general title - Extract from the Foreword of  
ISO 15614-12:2014**

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 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

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EUROPEAN STANDARD

**EN ISO 15614-12**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2014

ICS 25.160.10

Supersedes EN ISO 15614-12:2004

English Version

**Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 12: Spot, seam and projection welding (ISO 15614-12:2014)**

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Épreuve de qualification d'un mode opératoire de soudage - Partie 12: Soudage par points, à la molette et par bossages (ISO 15614-12:2014)

Anforderung und Qualifizierung von Schweißverfahren für metallische Werkstoffe - Schweißverfahrensprüfung - Teil 12: Widerstandspunkt-, Rollennaht- und Buckelschweißen (ISO 15614-12:2014)

This European Standard was approved by CEN on 14 June 2014.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION  
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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## **Foreword**

This document (EN ISO 15614-12:2014) 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 2015, and conflicting national standards shall be withdrawn at the latest by January 2015.

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

This document supersedes EN ISO 15614-12:2004.

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### **Endorsement notice**

The text of ISO 15614-12:2014 has been approved by CEN as EN ISO 15614-12:2014 without any modification.

## Introduction

It is intended that all new welding procedure qualifications be carried out in accordance with this part of ISO 15614 from the date of its issue.

However, this part of ISO 15614 does not invalidate previous welding procedure qualifications made to other standards or specifications, provided the intent of its technical requirements is satisfied and the previous welding procedure qualifications are relevant to the application and production work on which they are to be employed.

Also, where additional tests have to be carried out to make the qualification technically equivalent, it is necessary only to perform the additional tests on a test piece made in accordance with this part of ISO 15614.

The various parts of ISO 15614 comprise, in their turn, a series of International Standards on welding, details of which are given in ISO 15607, Annex A.



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

## Part 12: Spot, seam and projection welding

### 1 Scope

This part of ISO 15614 specifies the tests which can be used for qualification of welding procedure specifications for spot, seam, and projection welding processes.

This International Standard is part of the ISO 15614 series. Details of this series are given in ISO 15607, Annex A.

This part of ISO 15614 defines the conditions for carrying out tests and the limits of validity of a qualified welding procedure for all practical welding operations covered by this part of ISO 15614.

The tests required to qualify the procedure for a particular component/assembly depend on the performance and quality requirements of the component/assembly and shall be established before any qualification is undertaken.

Tests shall be carried out in accordance with this part of ISO 15614 unless more severe tests are specified by the relevant application standard or contract when these shall apply.

The acceptability of applying the principles of this part of ISO 15614 to other resistance welding processes should be established before any qualification is undertaken.

NOTE Specific service, material, or manufacturing conditions might require more comprehensive testing than is specified by this part of ISO 15614.

Such tests can include:

- method for fatigue testing for spot welded joints;
- specimen dimensions and procedure for impact, shear and cross-tension testing resistance spot and projection welds;
- bend test;
- surface crack detection;
- ultrasonic tests and X-ray test;
- chemical analysis and corrosion tests;
- micro examination, including assessment of hot cracking behaviour;
- tests of components or complete welded assemblies.

This part of ISO 15614 covers the following resistance welding processes, as defined in ISO 4063:

- 21 – resistance spot welding;
  - 211 – indirect spot welding;

- 212 – direct spot welding;
- 22 – resistance seam welding;
  - 221 – lap seam welding;
  - 222 – mash seam welding;
  - 225 – foil butt-seam welding;
  - 226 – seam welding with strip;
- 23 – projection welding;
  - 231 – indirect projection welding;
  - 232 – direct projection welding.

## **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 669, *Resistance welding — Resistance welding equipment — Mechanical and electrical requirements*

ISO 10447, *Resistance welding — Peel and chisel testing of resistance spot and projection welds*

ISO 14270, *Specimen dimensions and procedure for mechanized peel testing resistance spot, seam and embossed projection welds*

ISO 14271, *Resistance welding — Vickers hardness testing (low-force and microhardness) of resistance spot, projection, and seam welds*

ISO 14272, *Specimen dimensions and procedure for cross tension testing resistance spot and embossed projection welds*

ISO 14273, *Specimen dimensions and procedure for shear testing resistance spot, seam and embossed projection welds*

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

ISO 15609-5, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding*

ISO 17653, *Resistance welding — Destructive tests on welds in metallic materials — Torsion test of resistance spot welds*

ISO 17677-1, *Resistance welding — Vocabulary — Part 1: Spot, projection and seam welding*

## **3 Terms and definitions**

For the purposes of this document, the terms and definitions given in ISO 669, ISO 15607, and ISO 17677-1 apply.

## **4 Preliminary welding procedure specification (PWPS)**

The preliminary welding procedure specification shall be prepared in accordance with ISO 15609-5.

## 5 Welding procedure test

The preparation and testing of test pieces shall be in accordance with [Clauses 6](#) and [7](#) of this part of ISO 15614.

## 6 Test piece

### 6.1 General

The welded assembly to which the welding procedure will relate to in production shall be represented by actual components or by preparing a standardized test piece in accordance with [6.2](#).

Test specimens shall be cut from the actual components; the test piece is welded separately according to [6.3](#). Test specimens or test pieces from the same material with relevant flange widths or overlap length should be used. When applicable, shunting and inductive effects shall be taken into account.

If required by the application standard, the direction of plate rolling shall be marked on the test piece.

### 6.2 Shape and dimensions of test pieces and test specimens for destructive testing

#### 6.2.1 General

The shape and dimensions of the test pieces and test specimens and the test procedures are specified in the following International Standards: ISO 14270, ISO 14271, ISO 14272, ISO 14273, ISO 17653, and ISO 10447.

#### 6.2.2 Macrosection

The test specimens shall be prepared and etched to produce transverse and/or longitudinal sections in order to clearly show the nugget, the heat affected zone (HAZ), and, if necessary, the weld profile.

The transverse macrosection shall include the unaffected parent material.

### 6.3 Welding of components, test pieces or test specimens

Preparation of components, test pieces or test specimens, and welding of test pieces or test specimens shall be carried out in accordance with the PWPS, and under the general conditions of production welding (parameters, equipment, etc.) which they shall represent.

If tack welds are used in the case of seam welds, they should be included in the final test piece.

Welding and testing of the test pieces shall be witnessed by an examiner or examining body and the details of this shall be established before any qualification is undertaken.

## 7 Examination and testing

### 7.1 Extent of testing

The testing includes both non-destructive testing (NDT) and/or destructive testing.

The selection of test types and the number of test specimens depends on the performance and quality requirements of the component/assembly and shall be established before any qualification is undertaken; examples are given in [Table 1](#).

When the standard deviation for test results in shear and cross-tension tests is not necessary, the reduced number of specimens shall be established before any qualification is undertaken.