

**SLOVENSKI
PREDSTANDARD**

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Popis in odobritev varilnih postopkov za kovinske materiale - Preskus varilnega postopka – 3. del: Talilno varjenje in varjenje s pritiskom nelegiranih in nizkolegiranih jeklenih litin (ISO/DIS 15614-3:2005)

(istoveten prEN ISO 15614-3:2005)

Specification and qualification of welding procedures for metallic materials -
Welding procedure test - Part 3: Fusion and pressure welding of non-alloyed and
low-alloyed cast irons (ISO/DIS 15614-3:2005)

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Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 3: Fusion and pressure welding of non-alloyed and low-alloyed cast irons (ISO/DIS 15614-3:2005)

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Epreuve de qualification d'un mode opératoire de soudage - Partie 3: Soudage par fusion et soudage sous pression des fontes alliées et non alliées (ISO/DIS 15614-3:2005)

Anforderung und Qualifizierung von Schweißverfahren für metallische Werkstoffe - Schweißverfahrensprüfung - Teil 3: Schmelzschiessen und Pressschweißen von unlegierten und niedrig legierten Gusseisen (ISO/DIS 15614-3:2005)

This draft European Standard is submitted to CEN members for second parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 121.

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Foreword

This document (prEN ISO 15614-3:2005) 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 document is currently submitted to the second parallel Enquiry.

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

Part 3:

Fusion and pressure welding of non-alloyed and low-alloyed cast irons

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

Partie 3: Soudage par fusion et soudage sous pression des fontes alliées et non alliées

ICS 25.160.10

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This draft International Standard is a draft standard developed within the European Committee for Standardization (CEN) and processed under the CEN-lead mode of collaboration as defined in the Vienna Agreement. The document has been transmitted by CEN to ISO for circulation for ISO member body voting in parallel with CEN enquiry. Comments received from ISO member bodies, including those from non-CEN members, will be considered by the appropriate CEN technical body. Should this DIS be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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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.

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 15614-3 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, and by Technical Committee CEN/TC 121, *Welding* in collaboration.

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: Arc welding of cast irons*
- *Part 4: Finishing welding of aluminium castings*
- *Part 5: Arc welding of titanium, zirconium and their alloys*
- *Part 6: Copper and copper alloys*
- *Part 7: Overlay welding*
- *Part 8: Welding of tubes to tube-plate joints*
- *Part 9: Underwater hyperbaric wet welding*
- *Part 10: Hyperbaric dry welding*
- *Part 11: Electron and laser beam welding*
- *Part 12: Spot, seam and projection welding*
- *Part 13: Flash and butt welding*

Introduction

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

Welding procedure tests for flash welding are presented in EN ISO 15614-13 and for friction welding in EN ISO 15620.

Requests for official interpretations of any aspect of this standard 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.

1 Scope

This Standard specifies how a preliminary welding procedure specification for production and repair welding of non-alloyed and low-alloyed cast irons is qualified by welding procedure tests. It applies to fusion and pressure welding.

This standard defines the conditions for execution of the welding procedure tests and the range of qualification for welding procedures for all practical welding operations within the range of variables listed in clause 9.

This part of ISO 15614 is applicable to all new welding procedures. However, it does not invalidate previous welding procedure tests made to former national standards or specifications. Where additional tests have to be carried out to make the qualification technically equivalent, it is only necessary to do the additional tests on a test piece made in accordance with this standard.

Additional tests may be required by application standards.

This Standard is applicable to welding Grey cast irons of non-alloyed and low-alloyed cast iron castings according to:

- EN 1561 Founding;
- EN 1562 Founding – Malleable cast irons;
- EN 1563 Founding – Spheroidal graphite cast irons;
- EN 1564 Austempered ductile cast irons;

The principles of this standard are also applicable for welding cast iron to steel or to other unalloyed and low-alloyed cast iron materials.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 571-1, *Non destructive testing — Penetrant testing — Part 1: General principles*

EN 970, *Non-destructive examination of fusion welds — Visual examination*

EN 1011-1, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*

EN 1011-8:2004, *Welding — Recommendations for welding of metallic materials — Part 8: Welding of cast irons*

EN 1321, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*

EN 1561, *Founding — Grey cast irons*

EN 1562, *Founding — Malleable cast irons*

EN 1563, *Founding — Spheroidal graphite cast irons*

EN 1564, *Founding — Austempered ductile cast irons*

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test*

EN 10045-1, *Metallic materials — Charpy impact test — Part 1: Test method*

EN ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers.*

EN ISO 6947, *Welds — Working positions — Definitions of angles of slope and rotation*

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

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

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

EN ISO 15611, *Specification and qualification of welding procedures for metallic materials — Qualification related to previous experience*

EN ISO 15613, *Specification and qualification of welding procedures for metallic materials — Qualification by a pre-production test*

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

ISO 783, *Metallic materials — Tensile testing at elevated temperature*

ISO 14175, *Welding consumables — Shielding gases for arc welding and cutting*

3 Definitions

In addition to EN ISO 15607 the following definitions are applicable for the use of this Standard:

3.1

production welding

any welding carried out during manufacture before final delivery to the end user

3.2

joint welding

production welding used to join components together

3.3

finishing welding

production welding carried out in order to remove casting defects to ensure the required quality of castings

3.4**repair welding**

any welding carried out after delivery to the end user, i.e. after the product has been in service

4 Welding processes

Welding is covered by the following welding processes in accordance with EN ISO 4063:

111 manual metal arc welding (metal-arc welding with covered electrode) ;

114 self-shielded tubular-cored arc welding;

121 submerged arc welding with one wire electrode ;

131 metal inert gas welding, MIG welding ;

135 metal active gas welding, MAG welding ;

136 tubular-cored metal arc welding with active gas shield ;

141 Tungsten inert gas welding; TIG welding,

15 Plasma arc welding,

311 Oxy-acetylene welding

5 Preliminary welding procedure specification (pWPS)

The preliminary welding procedure specification shall be prepared in accordance with EN ISO 15609-1 or EN ISO 15609-2.

6 Welding procedure test

The welding and testing of test pieces shall be in accordance with clauses 7 and 8.

The welder or welding operator who undertakes the welding procedure test satisfactorily in accordance with this standard is qualified to weld within the range of qualification according to clause 9.

7 Test piece**7.1 General**

The test piece shall be in accordance with that shown in Figure 1. It can be cast separately or removed from the casting/component. Preparation of the sufficiently large test pieces is basically to be by means of chip machining.

When the standardized test pieces as shown in this standard do not represent the production/joint geometry the use of EN ISO 15611 or EN ISO 15613 shall be required.