

# **SLOVENSKI PREDSTANDARD**

# **oSIST prEN ISO 15614-3:2006**

januar 2006

---

---

**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)

(<https://standards.iteh.ai>)  
Document Preview

[SIST EN ISO 15614-3:2008](https://standards.iteh.ai/catalog/standards/sist/71b1d0be-c3c0-4686-be7a-30f302efbe48/sist-en-iso-15614-3-2008)

<https://standards.iteh.ai/catalog/standards/sist/71b1d0be-c3c0-4686-be7a-30f302efbe48/sist-en-iso-15614-3-2008>

---

ICS 25.160.10

Referenčna številka  
oSIST prEN ISO 15614-3:2006(en)



September 2005

ICS

English Version

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.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

**Warning** : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

## **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.

**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[SIST EN ISO 15614-3:2008](https://standards.iteh.ai/catalog/standards/sist/71b1d0be-c3c0-4686-be7a-30f302efbe48/sist-en-iso-15614-3-2008)

<https://standards.iteh.ai/catalog/standards/sist/71b1d0be-c3c0-4686-be7a-30f302efbe48/sist-en-iso-15614-3-2008>



## 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

#### ISO/CEN PARALLEL ENQUIRY

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.**

**Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.**

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

SIST EN ISO 15614-3:2008

<https://standards.iteh.ai/catalog/standards/sist/71b1d0be-c3c0-4686-be7a-30f302efbe48/sist-en-iso-15614-3-2008>

**Copyright notice**

This ISO document is a Draft International Standard and is copyright-protected by ISO. Except as permitted under the applicable laws of the user's country, neither this ISO draft nor any extract from it may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission being secured.

Requests for permission to reproduce should be addressed to either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Reproduction may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

## Contents

<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>1</b>
<b>3</b>	<b>Definitions .....</b>	<b>2</b>
<b>4</b>	<b>Welding processes .....</b>	<b>3</b>
<b>5</b>	<b>Preliminary welding procedure specification (pWPS) .....</b>	<b>3</b>
<b>6</b>	<b>Welding procedure test .....</b>	<b>3</b>
<b>7</b>	<b>Test piece .....</b>	<b>3</b>
<b>7.1</b>	<b>General .....</b>	<b>3</b>
<b>7.2</b>	<b>Shape and dimensions of test piece .....</b>	<b>3</b>
<b>7.3</b>	<b>Welding of test piece .....</b>	<b>6</b>
<b>8</b>	<b>Examination and testing .....</b>	<b>6</b>
<b>8.1</b>	<b>Extent of testing .....</b>	<b>6</b>
<b>8.2</b>	<b>Location and taking of test specimens .....</b>	<b>7</b>
<b>8.3</b>	<b>Non-destructive testing .....</b>	<b>8</b>
<b>8.4</b>	<b>Destructive tests .....</b>	<b>8</b>
<b>8.5</b>	<b>Acceptance criteria .....</b>	<b>9</b>
<b>8.6</b>	<b>Re-testing .....</b>	<b>9</b>
<b>9</b>	<b>Range of qualification .....</b>	<b>9</b>
<b>9.1</b>	<b>General .....</b>	<b>9</b>
<b>9.2</b>	<b>Qualification related to the manufacturer .....</b>	<b>9</b>
<b>9.3</b>	<b>Qualification related to the material .....</b>	<b>9</b>
<b>9.4</b>	<b>Qualification common to all welding procedures .....</b>	<b>12</b>
<b>9.5</b>	<b>Qualification specific to processes .....</b>	<b>14</b>
<b>10</b>	<b>Welding procedure qualification record form (WPQR) .....</b>	<b>15</b>
<b>Annex A</b>	<b>(informative) Welding Procedure Qualification Record form (WPQR) .....</b>	<b>16</b>
<b>Annex ZA</b>	<b>(informative) Relationship between this European Standard and the Essential Requirements of EU Directive 97/23/EC .....</b>	<b>19</b>
<b>Bibliography</b>	<b>.....</b>	<b>20</b>

## 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](http://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