



International  
Standard

**ISO 15614-11**

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

**Part 11:**

**Electron and laser beam welding**

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

*Partie 11: Soudage par faisceau d'électrons et par faisceau laser*

**Second edition  
2025-10**

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

ISO 15614-11:2025

<https://standards.iteh.ai/catalog/standards/iso/1a5621dd-4b7a-4407-983a-008043e2156f/iso-15614-11-2025>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## Contents

Page

|                                                                                         |           |
|-----------------------------------------------------------------------------------------|-----------|
| <b>Foreword</b>                                                                         | <b>v</b>  |
| <b>Introduction</b>                                                                     | <b>vi</b> |
| <b>1 Scope</b>                                                                          | <b>1</b>  |
| <b>2 Normative references</b>                                                           | <b>1</b>  |
| <b>3 Terms and definitions</b>                                                          | <b>2</b>  |
| <b>4 Preliminary welding procedure specification (pWPS)</b>                             | <b>2</b>  |
| <b>5 Welding procedure test</b>                                                         | <b>2</b>  |
| <b>6 Test piece</b>                                                                     | <b>2</b>  |
| 6.1 General                                                                             | 2         |
| 6.2 Shape and dimensions of test pieces                                                 | 3         |
| 6.2.1 General                                                                           | 3         |
| 6.2.2 Linear butt weld                                                                  | 3         |
| 6.2.3 Butt weld in pipe                                                                 | 4         |
| 6.2.4 Butt weld pipe to plate (set in)                                                  | 4         |
| 6.2.5 Other types                                                                       | 5         |
| 6.3 Welding of test pieces                                                              | 7         |
| <b>7 Examination and testing</b>                                                        | <b>7</b>  |
| 7.1 Extent of testing                                                                   | 7         |
| 7.2 Location and cutting of test specimens                                              | 10        |
| 7.3 Non-destructive examination                                                         | 14        |
| 7.3.1 Method                                                                            | 14        |
| 7.3.2 Acceptance criteria                                                               | 14        |
| 7.4 Destructive tests                                                                   | 14        |
| 7.4.1 Transverse tensile testing                                                        | 14        |
| 7.4.2 Bend testing                                                                      | 14        |
| 7.4.3 Impact testing                                                                    | 15        |
| 7.4.4 Hardness testing                                                                  | 15        |
| 7.4.5 Metallographic examination                                                        | 15        |
| 7.5 Retesting                                                                           | 16        |
| <b>8 Range of qualification</b>                                                         | <b>16</b> |
| 8.1 General                                                                             | 16        |
| 8.2 Related to the manufacturer                                                         | 16        |
| 8.3 Related to the equipment                                                            | 16        |
| 8.4 Related to the jigs, fixtures and tooling                                           | 16        |
| 8.5 Related to the parent material                                                      | 17        |
| 8.5.1 Material group and subgroups                                                      | 17        |
| 8.5.2 Geometry of the assembly                                                          | 17        |
| 8.6 Related to the filler materials                                                     | 17        |
| 8.7 Related to the joint geometry                                                       | 17        |
| 8.8 Related to the presence of a weld backing                                           | 17        |
| 8.9 Related to the weld type                                                            | 18        |
| 8.10 Related to the welding position                                                    | 18        |
| 8.11 Related to the welding parameters                                                  | 18        |
| 8.11.1 Electron beam welding                                                            | 18        |
| 8.11.2 Laser beam welding                                                               | 18        |
| 8.12 Related to preheating                                                              | 18        |
| 8.13 Related to post-weld heat treatment                                                | 18        |
| 8.14 Related to the number of passes                                                    | 18        |
| 8.15 Duration of validity                                                               | 18        |
| <b>9 Welding procedure qualification record (WPQR)</b>                                  | <b>18</b> |
| <b>Annex A (informative) Example welding procedure qualification record (WPQR) form</b> | <b>20</b> |

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

[ISO 15614-11:2025](https://standards.itih.ai/catalog/standards/iso/1a5621dd-4b7a-4407-983a-008043e2156f/iso-15614-11-2025)

<https://standards.itih.ai/catalog/standards/iso/1a5621dd-4b7a-4407-983a-008043e2156f/iso-15614-11-2025>

## 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 document 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](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 [www.iso.org/iso/foreword.html](http://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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding and allied processes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15614-11:2002), which has been technically revised.

The main changes are as follows:

- normative references updated and ISO 15607 moved to Bibliography;
- acceptance level changed to quality level in accordance with the ISO 13919-1 and ISO 13919-2;
- terminology aligned with that used in other parts of the ISO 15614 series, where appropriate;
- figures updated and corrected, including symbols and keys;
- [Tables 1](#) to [4](#) revised;
- [6.2](#) reformatted and revised;
- [Clause 7](#) revised.

A list of all parts in the ISO 15614 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html). Official interpretations of ISO/TC 44 documents, where they exist, are available from this page: <https://committee.iso.org/sites/tc44/home/interpretation.html>.