

|            |   |  |
|------------|---|--|
| <b>STN</b> | <b>Stanovenie a schválenie postupov<br/>zvárania kovových materiálov<br/>Skúška postupu zvárania<br/>Časť 9: Hyperbarické zváranie<br/>za mokra pod vodou<br/>(ISO 15614-9: 2025)</b> | <b>STN<br/>EN ISO 15614-9</b><br><br>05 0310 |
|------------|---|--|

Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 9: Underwater hyperbaric wet welding (ISO 15614-9:2025)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/26

Obsahuje: EN ISO 15614-9:2025, ISO 15614-9:2025

**141999**

---

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2026  
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.



EUROPEAN STANDARD

EN ISO 15614-9

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2025

ICS 25.160.10

English Version

## Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 9: Underwater hyperbaric wet welding (ISO 15614-9:2025)

Descriptif et qualification d'un mode opératoire de soudage pour les matériaux métalliques - Epreuve de qualification d'un mode opératoire de soudage - Partie 9: Soudage hyperbare en pleine eau (ISO 15614-9:2025)

Anforderung und Qualifizierung von Schweißverfahren für metallische Werkstoffe - Schweißverfahrensprüfung - Teil 9: Nassschweißen unter Überdruck (ISO 15614-9:2025)

This European Standard was approved by CEN on 10 November 2025.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN ISO 15614-9:2025 (E)**

| <b>Contents</b>               | <b>Page</b> |
|-------------------------------|-------------|
| <b>European foreword.....</b> | <b>3</b>    |

## **European foreword**

This document (EN ISO 15614-9:2025) 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 AFNOR.

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 May 2026, and conflicting national standards shall be withdrawn at the latest by May 2026.

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.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

## **Endorsement notice**

The text of ISO 15614-9:2025 has been approved by CEN as EN ISO 15614-9:2025 without any modification.



# International Standard

**ISO 15614-9**

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

### **Part 9: Underwater hyperbaric wet welding**

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

*Partie 9: Soudage hyperbare en pleine eau*

**First edition  
2025-11**

**ISO 15614-9:2025(en)****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

**ISO 15614-9:2025(en)****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 Qualification of welding procedure specifications</b> .....                       | <b>3</b>  |
| 4.1 General.....   | 3         |
| 4.2 Related to the parent material.....  | 4         |
| 4.2.1 Parent material grouping.....  | 4         |
| 4.3 Welding procedure qualification record (WPQR).....                                 | 5         |
| 4.4 Welding procedure specification (WPS).....   | 5         |
| <b>5 Classification of Welds</b> .....   | <b>5</b>  |
| 5.1 Definitions of weld quality levels.....  | 5         |
| 5.2 Selection of the weld quality level.....   | 6         |
| <b>6 Welding variables and range of qualification</b> .....                            | <b>6</b>  |
| <b>7 Depth limitations</b> .....   | <b>7</b>  |
| <b>8 Welding procedure test</b> .....  | <b>8</b>  |
| <b>9 Test piece</b> .....  | <b>8</b>  |
| 9.1 General.....   | 8         |
| 9.2 Shape and dimensions of test pieces.....   | 8         |
| 9.3 Welding of test pieces.....  | 12        |
| <b>10 Testing and examination</b> .....  | <b>13</b> |
| 10.1 General.....  | 13        |
| 10.2 Tensile shear tests for fillet welds.....   | 13        |
| 10.3 Type and extent of testing.....   | 13        |
| 10.4 Weld quality Levels A, B and Z.....   | 13        |
| 10.5 Location of test specimens.....   | 17        |
| 10.6 Non-destructive testing.....  | 25        |
| 10.7 Destructive testing.....  | 25        |
| 10.7.1 Transverse tensile test.....  | 25        |
| 10.7.2 Fillet weld shear-strength test.....  | 25        |
| 10.7.3 All-weld metal tensile test.....  | 26        |
| 10.7.4 Bend test.....  | 26        |
| 10.7.5 Macroscopic examination.....  | 27        |
| 10.7.6 Hardness testing.....   | 27        |
| 10.7.7 Impact testing.....   | 27        |
| 10.7.8 Fillet weld fracture test.....  | 28        |
| 10.8 Type and extent of testing for project specific test pieces.....                  | 28        |
| <b>11 Acceptance requirements for test pieces</b> .....                                | <b>28</b> |
| <b>12 Re-testing</b> .....   | <b>34</b> |
| 12.1 General.....  | 34        |
| 12.2 Hardness testing.....   | 34        |
| 12.3 Impact testing.....   | 34        |
| <b>13 Range of qualification</b> .....   | <b>34</b> |
| 13.1 General.....  | 34        |
| 13.2 Range of qualification for welding positions.....                                 | 34        |
| <b>Annex A (informative) Different phases in welding procedure qualification</b> ..... | <b>36</b> |
| <b>Annex B (informative) Branch connections</b> .....                                  | <b>37</b> |

**ISO 15614-9:2025(en)**

|  |           |
|--|-----------|
| <b>Annex C (informative) Example welding procedure qualification record (WPQR)</b> ..... | <b>38</b> |
| <b>Bibliography</b> .....  | <b>42</b> |

**ISO 15614-9:2025(en)****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 15, *Underwater 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).

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>.

**ISO 15614-9:2025(en)****Introduction**

The primary purpose of welding procedure qualification is to demonstrate that the joining process proposed for construction, including preliminary and subsequent treatment, is capable of producing joints having the necessary mechanical properties and conforming to the non-destructive testing (NDT) requirements for the intended application.

Before a particular welding procedure is used in production, the manufacturer should determine and document the suitability of the welding procedure specification (WPS) to produce a weld of the required quality.

In this document, the term "welding procedure specification" comprises all the activities which influence the welding result, such as preparation, welding parameters, and post treatment.

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

## Part 9: Underwater hyperbaric wet welding

### 1 Scope

This document specifies how a preliminary welding procedure specification (pWPS) is qualified by welding procedure tests.

This document is applicable to production welding and repair welding.

This document is applicable to fusion welding of steels covered by groups 1, 2, 3 and 8 in accordance with ISO 15608 in a hyperbaric wet environment.

This document is applicable to the following welding processes, in accordance with ISO 4063:2023, applicable in hyperbaric wet environments:

- 111 manual metal arc welding (metal arc welding with covered electrode);
- 114 self-shielded tubular-cored arc welding.

The principles of this document can be applied to other steel groups and fusion welding processes not listed.

This document specifies three weld quality levels, A, B, and Z in order to permit application to a wide range of weldments. Each weld quality level defines a set of criteria for weldment properties that are established during qualification.

This document does not address the selection of the weld quality level to meet the requirements of a particular application.

### 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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 4136, *Destructive tests on welds in metallic materials — Transverse tensile test*

ISO 5173, *Destructive tests on welds in metallic materials — Bend tests*

ISO 5178, *Destructive tests on welds in metallic materials — Longitudinal tensile test on weld metal in fusion welded joints*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 6947:2019, *Welding and allied processes — Welding positions*

ISO 9015-1, *Destructive tests on welds in metallic materials — Hardness testing — Part 1: Hardness test on arc welded joints*

**ISO 15614-9:2025(en)**

ISO 9016, *Destructive tests on welds in metallic materials — Impact tests — Test specimen location, notch orientation and examination*

ISO 9017, *Destructive tests on welds in metallic materials — Fracture test*

ISO 9018, *Destructive tests on welds in metallic materials — Tensile test on cruciform and lapped joints*

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

ISO 15618-1, *Qualification testing of welders for underwater welding — Part 1: Hyperbaric wet welding*

ISO 17636-1, *Non-destructive testing of welds — Radiographic testing — Part 1: X- and gamma-ray techniques with film*

ISO 17636-2, *Non-destructive testing of welds — Radiographic testing — Part 2: X- and gamma-ray techniques with digital detectors*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

ISO 17639, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*

ISO 17640, *Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment*

ISO/TR 25901-1, *Welding and allied processes — Vocabulary — Part 1: General terms*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**