



ISO 11970

**Specification and qualification of
welding procedures for production
welding of steel and nickel-base
castings**

*Descriptif et qualification de modes opératoires de soudage pour
le soudage de production des pièces moulées en acier et à base
de nickel*

**Third edition
2025-11**

This is a preview of ISO 11970:2025. [Click here to purchase the full version from the ANSI store.](#)



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
Website: www.iso.org

Published in Switzerland

This is a preview of ISO 11970:2025. [Click here to purchase the full version from the ANSI store.](#)

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and symbols	2
3.1 Terms and definitions.....	2
4 Preliminary welding procedure specification (pWPS)	2
5 Welding procedure qualification	2
6 Test piece	2
6.1 General.....	2
6.2 Shape and dimensions of test piece.....	2
6.3 Welding of the test piece.....	3
7 Examination and testing	4
7.1 Extent of testing.....	4
7.2 Location and cutting of test specimens.....	5
7.3 Non-destructive testing.....	5
7.4 Destructive test.....	6
7.4.1 Transverse (to weld groove) tensile test.....	6
7.4.2 Macro examination.....	6
7.4.3 Micro examination.....	6
7.4.4 Impact test.....	6
7.4.5 Hardness test.....	7
7.5 Qualification and retesting.....	7
7.6 Welder qualification.....	8
8 Range of qualification	8
8.1 General.....	8
8.2 Related to the manufacturer.....	8
8.3 Related to the material.....	8
8.3.1 Parent metal — Grouping system for cast steel grades.....	8
8.3.2 Parent metal thickness.....	9
8.4 Common to all welding procedures.....	9
8.4.1 Welding process.....	9
8.4.2 Welding positions.....	10
8.4.3 Type of joint.....	10
8.4.4 Filler metal.....	10
8.4.5 Type of current.....	10
8.4.6 Heat input.....	11
8.4.7 Preheat temperature.....	11
8.4.8 Interpass temperature.....	11
8.4.9 Post-weld heat treatment.....	11
8.5 Specific to process.....	11
9 Welding procedure qualification record (WPQR)	12
Annex A (informative) Record form (WPQR) welding procedure qualification — Test certificate	13
Annex B (normative) Details of weld testing	14
Bibliography	17

This is a preview of ISO 11970:2025. [Click here to purchase the full version from the ANSI store.](#)

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).

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. 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.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 11, *Steel castings*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459/SC 11, *Steel castings and forgings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 11970:2016), which has been technically revised.

The main changes are as follows:

- appropriate reference standards have been added;
- minor grammatical changes were made.

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.

This is a preview of ISO 11970:2025. [Click here to purchase the full version from the ANSI store.](#)

All welding procedure qualifications for production welding of steel castings are intended to be in accordance with this document.

All new welding procedure tests are to be carried out in accordance with this document from the date of its issue. However, this document does not invalidate previous welding procedure tests made to former national standards or specifications, such as ASME Section IX^[1] or to previous editions of this document.

Previous procedure qualifications that conform to the range of qualification of [Clause 8](#) are valid under this document.

Where additional tests have to be carried out to complete the qualification, it is only necessary to perform the additional tests to the requirements of [Clauses 6](#) and [7](#).

In the case of specific service, material or manufacturing conditions, tests more comprehensive than those specified by this document can be specified by the purchaser, in order to gain more information, e.g. longitudinal weld tensile tests, bend tests, chemical analyses, ferrite determination in austenitic stainless steels, elongation after fracture, Charpy V-notch impact tests, and radiographic tests.