



SLOVENSKI STANDARD
oSIST prEN ISO 11970:2024
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Popis in kvalifikacija varilnih postopkov za proizvodno varjenje jeklenih ulitkov (ISO/DIS 11970:2024)

Specification and qualification of welding procedures for production welding of steel castings (ISO/DIS 11970:2024)

Anforderungen und Anerkennung von Schweißverfahren für das Produktionsschweißen von Stahlguss (ISO/DIS 11970:2024)

Descriptif et qualification de modes opératoires de soudage pour le soudage de production des aciers moulés (ISO/DIS 11970:2024)

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DRAFT International Standard

Specification and qualification of welding procedures for production welding of steel castings

*Descriptif et qualification de modes opératoires de soudage pour
le soudage de production des aciers moulés*

ICS: 25.160.10; 77.140.80

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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.

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 documents 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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 11, *Steel castings*.

This third edition cancels and replaces the second edition (ISO 11970:2016), which has been technically revised. In particular, appropriate reference standards have been added and minor grammatical changes were made.

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Introduction

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 or to previous editions of this document.

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Specification and qualification of welding procedures for production welding of steel castings

1 Scope

This document specifies how a welding procedure specification (WPS) for production welding of steel castings is qualified. Tests are intended to be carried out in accordance with this document unless additional tests are specified by the purchaser or by agreement between the contracting parties.

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](#).

It defines the conditions for the execution of welding procedure qualification tests and the limits of validity of a qualified welding procedure for all practical welding operations within the range of essential variables.

This document applies to the arc welding of steel castings. The principles of this International Standard can be applied to other fusion welding processes subject to agreement between the contracting parties.

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.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable to its application. 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 857-1, *Welding and allied processes — Vocabulary — Part 1: Metal welding processes*

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

ISO 4969, *Steel — Etching method for macroscopic examination*

ISO 4986, *Steel and iron castings — Magnetic particle testing*

ISO 4987, *Steel and iron castings — Liquid penetrant testing*

ISO 4992-1, *Steel castings — Ultrasonic testing — Part 1: Steel castings for general purposes*

ISO 4992-2, *Steel castings — Ultrasonic testing — Part 2: Steel castings for highly stressed components*

ISO 4993, *Steel and iron castings — Radiographic testing*

ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

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

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

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

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

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

ISO 15612, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption of a standard welding procedure specification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 857-1 and ISO 15607 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org>

3.1 production welding

any welding, carried out during manufacturing before final delivery to the purchaser

3.1.1 joint welding

production welding used to weld cast components together or weld cast components to wrought steels

3.1.2 finishing welding

production welding carried out in order to ensure the agreed quality of the casting

3.2 repair welding

4 welding carried out after delivery to the end user, i.e. after the casting has been in service Preliminary welding procedure specification (pWPS)

A preliminary welding procedure specification shall be prepared. It shall specify the range of all the relevant parameters in accordance with ISO 15612.

5 Welding procedure qualification

The making and testing of test specimens representing the type and the position of welding used in production shall be in accordance with [Clauses 6](#) and [7](#).

The welder who undertakes the welding procedure test satisfactorily in accordance with this document is qualified for the appropriate range of qualification according to ISO 9606-1. Additional welders shall be qualified in accordance with [7.6](#).