Welding and allied processes — Joint preparation —

Part 2:
Submerged arc welding of steels

Soudage et techniques connexes — Préparation de joints —

Partie 2: Soudage à l'arc sous flux en poudre des aciers

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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~~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).

~~Attention is drawn~~ISO draws attention to the possibility that ~~some of~~ the ~~elements~~implementation of this document may ~~be~~involve the ~~subject~~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. ~~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).~~

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 44, *Welding and allied processes*, Subcommittee SC 7, *Representation and terms*, 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 9692-2:1998~~)~~), of which ~~has been technically revised.~~it constitutes a minor revision. The ~~main~~ changes are as follows:

— Clause 1, fourth paragraph revised and moved to the Introduction;

— ISO 2553, ISO 6947 and ISO 9692-1 moved from Clause 2 to the Bibliography;

— alignment in Clause 5~~Clause 5~~ of the note explaining the reference numbers ~~of tables 1~~in Tables 1 and 2~~2~~ with the corresponding text in ~~standard~~ISO 9692-3;

— modification of the reference numbers in Tables 1 and 2 in accordance with the latest version of ~~tables 1 and 2 according to the new edition of ISO 2553~~ISO 2553 and reordering of the lines of the ~~Tables~~tables in ascending order of the new reference numbers.

A list of all parts in the ISO 9692 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. Official interpretations of ISO/TC 44 documents, where they exist, are available from this page: https://committee.iso.org/sites/tc44/home/interpretation.html.

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Introduction

~~The intention of this~~This document is _intended_ to ~~use it as an addition to~~_be used alongside_ ISO 9692-1~~:2013~~. It follows similar rules and the same layout. Therefore, the introduction given in ISO 9692-1~~:2013~~ also applies.

ISO 9692-1 specifies joint preparations for other arc welding processes (see ISO 4063), which are applicable when the root is not welded by submerged arc welding.

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Welding and allied processes — Joint preparation —

Part 2:
Submerged arc welding of steels

1 Scope

This document applies to types of joint preparation for submerged arc welding with one wire electrode (process 121 according to ~~IS0~~ ISO 4063) on steel.

This document covers only the welding positions PA and PB according to ~~IS0~~ ISO 6947. ~~In case~~If PC is used, special preparation ~~will be~~is necessary.

~~It~~This document applies to fully penetrated welds. For partly penetrated welds, types of joint preparation, shapes and dimensions ~~may~~can differ from the listed proposals if they are specified in the relevant application standard or agreed by the parties concerned.

~~If the root is welded by a different arc welding process (see ISO 4063), the joint preparation according to ISO 9692-1 should be taken into account.~~

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 2553:2019, Welding and allied processes — Symbolic representation on drawings — Welded joints~~

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

~~ISO 9692-1:2013, Welding and allied processes — Types of joint preparation — Part 1: Manual metal arc welding, gas-shielded metal arc welding, gas welding, TIG welding and beam welding of steels~~

ISO 15609-1~~:2019~~, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding*

3 Terms and definitions

No terms and ~~definition~~definitions are listed in this document.

ISO and IEC maintain terminology 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/

4 Materials

Joint preparations recommended in this document are suitable for all types of weldable steel.

5 Types of joint preparation

The recommended types of joint preparation and dimensions are specified in Table 1~~Table 1~~ and Table 2~~Table 2.~~.

The root gaps referred to in this document are those gaps presented after tack welding, if used.

This document gives no dimensions or type of possibly used backing materials. Root runs may also be used as backing. They may influence the quality requirements for welding (according to the relevant part of ~~the~~ ISO 3834 series) and the preparation as given in Table 1~~Table 1~~ and Table 2~~Table 2.~~. They shall be part of the welding procedure specification ~~according to~~in accordance with ISO 15609-1.

According to the application standard or agreement between contracting parties, it ~~may~~can be necessary to grind the slag before welding the next run.

The reference numbers in Tables 1~~Tables 1 to 2~~ and 2 have been determined in accordance with the following scheme:

— ~~——~~the first digit corresponds with the number of the table (e.g. digit 1 for Table 1~~Table 1~~ with joint preparation for butt welds, welded from one side);

— ~~——~~the second digit or numerical group corresponds with the number in ISO 2553 (e.g. digit 1 for square butt weld as given in ISO 2553:~~2013~~2019, Table 1);

— ~~——~~the third indication, expressed by a letter, covers the variants of joint preparations.

EXAMPLE   Joint preparation for a butt weld, welded from one side (1), finished for single-V butt weld (2):

~~——————————1.2~~

——————————————1.2

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https://standards.iteh.ai/catalog/standards/sist/ee48877b-067b-4fbf-90a2-929a8faced0d/iso-fdis-9692-2

**Table 1 — Joint preparations for butt welds, welded from one side**

Dimensions in millimetres

		Weld				Joint preparation				Welding position (in accordance with ISO 6947)	Remarks
Ref. ~~No~~ no.	Workpiece thickness t	Designation	Symbol (in accordance with ISO 2553)	Illustration	Cross-section	Angle ~~α, β~~ $α, β$	Gap b~~Radius~~ Radius R	Thickness of root face c	Depth of preparation h		
1.1	$3 ≤ t ≤ 12$	Square butt weld	‖			—	$b ≤ 0,5\,t$ max. 5	—	—	PA	With backing minimal thickness for backing: 5 mm or 0,5 t
1.2	$10 ≤ t ≤ 20$	Single-V butt weld	V			$30° ≤ α ≤ 50°$	$4 ≤ b ≤ 8$	$c ≤ 2$	—	PA	With backing minimal thickness for backing: 5 mm or 0,5 t
1.2.2	$t > 12$	Single-V butt weld with V root	ᐯ			$60° ≤ α ≤ 70°$ $4° ≤ β ≤ 10°$	$1 ≤ b ≤ 4$	$0 ≤ c ≤ 3$	$4 ≤ h ≤ 6$	PA	Root run welded with optional welding process

	Weld				Joint preparation					Welding position (in accordance with ISO 6947)	Remarks
Ref. ~~No~~ no.	Workpiece thickness t	Designation	Symbol (in accordance with ISO 2553)	Illustration	Cross-section	Angle ~~α, β~~ α, β	Gap b ~~Radius~~ Radius R	Thickness of root face c	Depth of preparation h		
1.2.6	$t \geq$ ~~$\geq$~~ 12	Single-U butt weld with V root				60° ~~$\leq \alpha \leq$~~ $\alpha \leq$ 70° 4° ~~$\leq \beta \leq$~~ $\beta \leq$ 10°	1 ~~$\leq$~~ $\leq b \leq$ 4 5 ~~$\leq$~~ $\leq R \leq$ 10	0 ~~$\leq$~~ $\leq c \leq$ 3	4 ~~$\leq$~~ $\leq h \leq$ 6	PA	Root run welded with optional welding process
1.4	3 ~~$\leq$~~ $\leq t \leq$ ~~$\leq$~~ 16	Single-bevel butt welded				30° ~~$\leq \beta \leq$~~ $\beta \leq$ 50°	1 ~~$\leq$~~ $\leq b \leq$ 4	$c \leq$ ~~$\leq$~~ 2	—	PA PB	With backing minimal thickness for backing: 5 mm or 0,5 t
1.6	$t \geq$ ~~$\geq$~~ 30	Single-U butt weld				4° ~~$\leq \beta \leq$~~ $\beta \leq$ 10°	1 ~~$\leq$~~ $\leq b \leq$ 4 5 ~~$\leq$~~ $\leq R \leq$ 10	2 ~~$\leq$~~ $\leq c \leq$ 3	—	PA	With backing minimal thickness for backing: 5 mm or 0~~,~~.5 t
1.7	$t \geq$ ~~$\geq$~~ 16	Single-J butt weld				4° ~~$\leq \beta \leq$~~ $\beta \leq$ 10°	2 ~~$\leq$~~ $\leq b \leq$ 4 5 ~~$\leq$~~ $\leq R \leq$ 10	2 ~~$\leq$~~ $\leq c \leq$ 3	—	PA PB	With backing minimal thickness for