

SLOVENSKI STANDARD
oSIST prEN ISO 2553:2017
01-maj-2017

Varjenje in sorodni postopki - Prikazovanje na risbah s simboli - Varjeni spoji
(ISO/DIS 2553:2017)

Welding and allied processes - Symbolic representation on drawings - Welded joints
(ISO/DIS 2553:2017)

Schweißen und verwandte Prozesse - Symbolische Darstellung in Zeichnungen -
Schweißverbindungen (ISO/DIS 2553:2017)

Soudage et techniques connexes - Représentations symboliques sur les dessins - Joints
soudés (ISO/DIS 2553:2017)

Ta slovenski standard je istoveten z: prEN ISO 2553

ICS:

01.100.20	Konstrukcijske risbe	Mechanical engineering drawings
25.160.40	Varjeni spoji in vari	Welded joints and welds

oSIST prEN ISO 2553:2017

en,fr,de

DRAFT INTERNATIONAL STANDARD

ISO/DIS 2553

ISO/TC 44/SC 7

Secretariat: BSI

Voting begins on:
2017-03-14Voting terminates on:
2017-06-05

Welding and allied processes — Symbolic representation on drawings — Welded joints

Soudage et techniques connexes — Représentations symboliques sur les dessins — Joints soudés

ICS: 25.160.40; 01.100.20

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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is Technical Committee ISO/TC 44, Welding and allied processes, Subcommittee SC 7, Representation and terms.

This fifth edition cancels and replaces the fourth edition (ISO 2553:2013), which has been technically revised.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 7 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Introduction

The symbols given in this document can be used on technical drawings for welded components. Design-related specifications, such as type, thickness, and length of weld, weld quality, surface treatment, filler material and testing specifications, can be indicated directly at the weld by means of the symbols given in this document. The principals of this document can be applied to brazed and soldered joints.

Clarity may be improved by references to collective information in the drawings or references to additional design-related documents.

Preparation for production may require detailed welding-related planning. The type of representation described in this document can be used for this purpose and complemented by additional production-related information (e.g. welding position, welding process, WPS, joint preparation, preheating etc.). This information is often given in production-related documents, such as work schedules or welding procedure specifications (WPS).

Technical drawings are intended to clearly and understandably illustrate design-related specifications. Welding-related drawings should be prepared and checked by specially trained personnel (see ISO 14731).

This edition of ISO 2553 recognizes that there are two different approaches in the global market to designate the arrow side and other side on drawings, and allows for either to be used in isolation, to suit a particular market need. Application of either approach identifies a welding symbol in accordance with this document. The approach in accordance with system A is based on ISO 2553:1992. The approach in accordance with system B is based upon standards used by Pacific Rim countries.

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Welding and allied processes — Symbolic representation on drawings — Welded joints

1 Scope

This document defines the rules to be applied for symbolic representation of welded joints on technical drawings. This may include information about the geometry, manufacture, quality and testing of the welds. The principles of this document may also be applied to soldered and brazed joints.

It is recognized that there are two different approaches in the global market to designate the arrow side and other side on drawings. In this document:

- clauses, tables and figures which carry the suffix letter "A" are applicable only to the symbolic representation system based on a dual reference line;
- clauses, tables and figures which carry the suffix letter "B" are applicable only to the symbolic representation system based on a single reference line;
- clauses, tables and figures which do not have the suffix letter "A" or "B" are applicable to both systems.

The symbols shown in this document may be combined with other symbols used on technical drawings, for example to show surface finish requirements.

An alternative designation method is presented which may be used to represent welded joints on drawings by specifying essential design information such as weld dimensions, quality level, etc. The joint preparation and welding process(es) are then determined by the production unit in order to meet the specified requirements.

NOTE Examples given in this document, including dimensions, are illustrative only and are intended to demonstrate the proper application of principles. They are not intended to represent good design practices, or to replace code or specification requirements.

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 128 (all parts), *Technical drawings — General principles of presentation*

ISO 129 1, *Technical drawings — Indication of dimensions and tolerances — Part 1: General principles*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 3098 2, *Technical product documentation — Lettering — Part 2: Latin alphabet, numerals and marks*

ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 25901 and the following apply.

3.1

welding symbol

symbol consisting of an arrow line and a reference line and which may also include elementary and supplementary symbols, dimensions and/or tail, used on technical drawings

Note 1 to entry: See Clause 4.

3.2

basic welding symbol

symbol consisting of an arrow line, reference line and tail used when the joint is not specified and only to indicate that a welded joint is to be made

Note 1 to entry: See 4.2.

3.3

arrow line

leader line used to indicate the joint that is to be welded generally drawn at 135° to the reference line

Note 1 to entry: See 4.6.

3.4

reference line

part of the welding symbol on which the elementary symbol is located, generally drawn parallel to the bottom edge of the drawing

Note 1 to entry: See 4.7.

3.5

tail

V shaped element added to the end of the continuous reference line away from the arrow line

Note 1 to entry: See 4.8.

3.6

arrow side

side of the joint to which the arrow line is pointing

Note 1 to entry: See 4.7.2.1.

3.7

other side

opposite side of the joint to the arrow side

Note 1 to entry: See 4.7.2.1.

3.8**elementary symbol**

symbol forming part of the welding symbol and drawn on the reference line to indicate the type of weld and joint preparation

Note 1 to entry: See 4.4.

3.9**supplementary symbol**

symbol used in conjunction with elementary symbols to convey additional information about the joint

Note 1 to entry: See 4.5.

3.10**complementary information**

non-symbolic information, relevant to the welds being made, which may be included in the tail of the welding symbol

Note 1 to entry: See 4.8.

3.11**intermittent weld**

series of weld elements made at intervals along a joint [ISO/TR 25901-1:2016]

Note 1 to entry: See 5.3.2.

3.11.1**chain intermittent weld**

intermittent weld on each side of a joint (usually fillet welds in T and lap joints) arranged so that the welds lie opposite one another along the joint

Note 1 to entry: See 5.3.2.2.

3.11.2**staggered intermittent weld**

intermittent weld on each side of a joint (usually fillet welds in T and lap joints) arranged so that the welds on one side lie opposite to the spaces on the other side along the joint

Note 1 to entry: See 5.3.2.3.

3.12**offset**

distance between the start of welding on one side of a staggered intermittent and the start of welding on the other side

Note 1 to entry: See 5.3.2.3, Table 3 and Table 5, No 2.6.

3.13**back run**

final run deposited on the root side of a fusion weld

3.14**backing weld**

backing in the form of a weld

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3.15**nominal weld length**

design length of a weld

NOTE 1 to entry: Nominal weld length is the length where the weld has its full size.

3.15.1**nominal length of weld element**

in intermittent welds, the nominal length of each element of the weld

NOTE 1 to entry: Nominal weld length is the length where the weld has its full size.

3.16**nominal throat thickness** a

<fillet welds> required value of the height of the largest isosceles triangle that can be inscribed in the section of a weld

Note 1 to entry: If other nominal throat thicknesses are specified, e.g. fillet welds with unequal leg lengths (see Table 5, item 2.3), they need to be clearly specified. In these cases, the symbol a shall not be used.**3.17****leg length** z

<fillet welds> distance from the actual or projected intersection of the fusion faces and the toe of a fillet weld, measured across the fusion face

3.18**penetration depth**

<butt welds> thickness of the weld metal excluding any reinforcement

3.19**deep penetration throat thickness** s

<fillet welds> nominal or effective throat thickness to which a certain amount of fusion penetration is added

3.20**flare-bevel weld**

butt weld between a joint member with a curved surface and another with a planar surface

Note 1 to entry: See Table 5.

3.21**flare-V weld**

butt weld between two members with curved surfaces

Note 1 to entry: See Table 5.

3.22**field weld**

weld made outside workshops usually at the place of final installation

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

— ISO Online browsing platform: available at <http://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

4 Welding symbol

4.1 General

A reference line and arrow line are required elements. Additional elements may be included to convey specific information.

It is preferable that the welding symbol is shown on the same side of the joint that the weld is to be made, i.e. the arrow side (see 4.7).

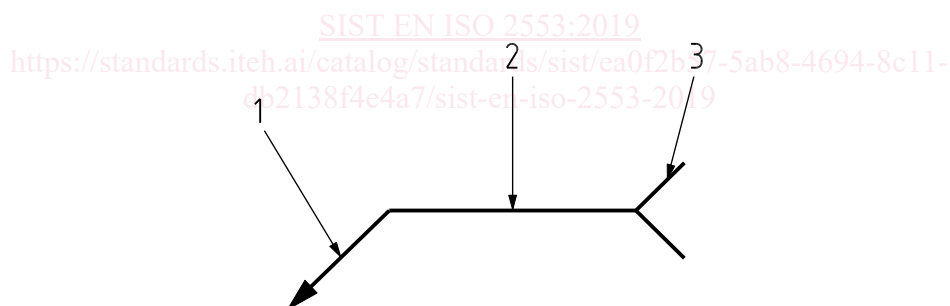
The thickness of the arrow lines, reference line, elementary symbols and lettering shall be in accordance with ISO 128 and ISO 3098-2.

In order not to overburden drawings, reference should be made to notes in the drawing or other design-related documents.

4.2 Basic welding symbol

If joint details are not specified and the only requirement is to indicate that a joint is to be welded, the basic symbol shown in Figure 1 may be used. In this case, a dual reference line is not required for system A (see 4.7.1A) as no details concerning the weld are being conveyed.

The basic welding symbol shall comprise an arrow line, reference line and a tail.



Key

- 1 arrow line
- 2 reference line
- 3 Tail

NOTE This symbol is often used to indicate the location of tack welds.

Figure 1 — Basic welding symbol (joint details and type not specified)

4.3 Welding symbol systems

This document recognizes two different systems, A and B, to designate the arrow side and other side on drawings.

The symbolic representation in system A is based on a dual reference line consisting of a continuous line and a dashed line (see 4.7).

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The symbolic representation in system B is based on a single reference line (see 4.7).

Clauses, Tables and Figures which carry the suffix "A" or "B" are applicable only to system A or system B respectively.

Clauses, tables and figures which do not have a suffix are applicable to both systems.

System A and B shall not be mixed and drawings shall clearly indicate which system is used including units of measurement in accordance with ISO 129 1.

Examples of comprehensive welding symbols showing the location of elements are given in Figure A.1.

4.4 Elementary symbols

4.4.1 General

Elementary symbols, in accordance with Table 1, can be added to the reference line in both systems A and B to indicate the type of weld to be made.

Elementary symbols form part of the welding symbol and shall be drawn attached to the reference line generally at the mid-point.

Elementary symbols may be complemented by:

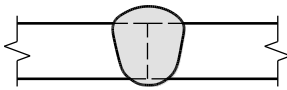

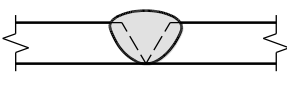
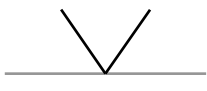
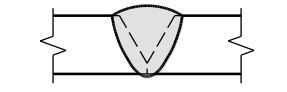

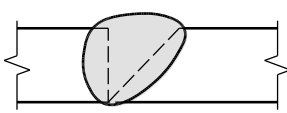
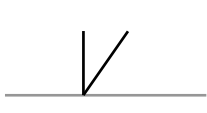
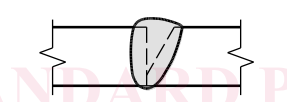
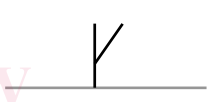
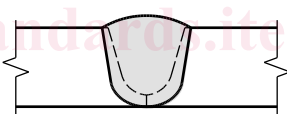
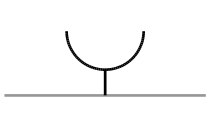
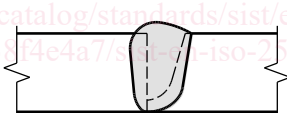

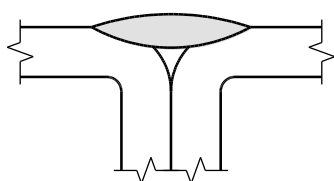
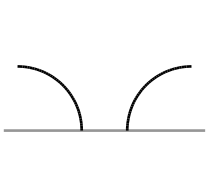
- supplementary symbols (see 4.5 and Table 3);
- dimensions (see Clause 5);
- complementary information.

The orientation of the elementary symbols shall not be changed to that shown.

Annex B gives guidance on tolerances and transition points for butt welds, edge welds and fillet welds.

If clear illustration by means of symbols is not possible, cross sections of the welds may be drawn and dimensioned.

Table 1 — Elementary symbols

No.	Designation (weld type)	Illustration of weld type (dashed lines show joint preparation prior to welding)	Symbol ^a
1	Square butt ^b		
2	Single-V butt ^b		
3	Single-V butt with broad root face ^b		
4	Single-bevel butt ^b		
5	Single-bevel butt with broad root face ^b		
6	Single-U butt ^b		
7	Single-J butt ^b		
8	Flare V		
^a The grey line is not part of the symbol. It indicates the position of the reference line. ^b Butt welds are full penetration unless otherwise indicated by dimensions on the welding symbol or by reference to other information, for example the WPS. ^c Symbol can also be used for joints with more than 2 members.			