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

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



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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. 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. 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 *Welding and allied processes*, Subcommittee SC 7, *Representation and terms*.

This fourth edition cancels and replaces the third edition (ISO 2553:1992), which has been technically revised.

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

Introduction

The symbols given in this standard 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 standard. The principals of this standard 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 standard can be used for this purpose and complemented by additional production-related information (e.g. welding position, welding process, WPS, weld preparation, preheating ...). 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 International Standard. 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.

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

1 Scope

This International Standard 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 standard 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 International Standard:

- 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 International Standard 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 International Standard, 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, in whole or in part, are normatively referenced in this document and are indispensable for 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 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*

ISO/TR 25901:2007, *Welding and related processes — Vocabulary*

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 to indicate welded joint type, location and joint preparation

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

[SOURCE: ISO/TR 25901:2007]

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 weld made on both sides of the joint 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

3.15**nominal weld length**

design length of a weld

3.15.1**nominal length of weld elements**

in intermittent welds, the design length of the elements of the weld

3.16**nominal throat thickness**

a

design value of the height of the largest isosceles triangle that can be inscribed in the section of a fillet weld

Note 1 to entry: Other design throat thicknesses may be used, but need to be specified.

3.17
leg length

z

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

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 [4.6](#)).

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 4.6.1A) as no details concerning the weld are being conveyed.

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