AS 1101.3:2026

Australian STANDARD®

STANDARDS Australia

Graphical symbols for general engineering

Part 3: Welding and non-destructive examination



AS 1101.3:2026

This Australian Standard® was prepared by WD-003, Welding Of Structures. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 10 June 2026.

This Standard was published on 26 June 2026.

The following are represented on Committee WD-003:

Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Steel Association
Australian Steel Institute
Australian Welding Institute
Austroads
Bureau of Steel Manufacturers of Australia
Energy Networks Australia
Engineers Australia
Materials Australia
National Association of Testing Authorities Australia
SafeWork NSW Agency
Steel Reinforcement Institute of Australia
TAFE NSW
The Australasian Corrosion Association
The University of Sydney
Weld Australia

This Standard was issued for comment as DR AS 1101.3:2025

Status of this document

Standards Australia publications are periodically reviewed to ensure their ongoing relevance and accuracy. This document may be withdrawn, revised, or superseded at any time. To verify this document's current status, visit:

www.standards.org.au

ISBN: 978 1 76175 823 2

Australian Standard®

Graphical symbols for general engineering

Part 3: Welding and non-destructive examination

Originated as AS Z6-1955.
Revised and redesignated as AS 1101.3-1979.
Previous edition 2005.
Fourth edition 2026.

© Standards Australia Ltd 2026

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Users must not use the content in this publication in combination with artificial intelligence (AI) tools for any purpose, unless they have the express prior written consent from Standards Australia.

How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's Standardisation Guide 006 for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee WD-003, Welding of Structures, to supersede AS 1101.3:2005.

The objective of this document is to specify symbols that provide the means of placing complete welding information on drawings. It describes the application of these symbols and includes illustrated examples for their use in various welding processes. A separate section covers the symbols to be used on drawings to specify non-destructive testing requirements.

This edition continues to be generally based on AWS A2.4, and also takes cognizance of ISO 2553.

The major changes in this edition include —

(a) updated and corrected figures;

(c) inclusion of additional terms and definitions;

(d) specification of distance between weld elements in lieu of the former pitch (centre to centre) spacing of intermittent welds; and

(e) amendment of the terminology for “non-destructive examination” to “non-destructive testing”.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

© Standards Australia Limited 2026

Contents

Page

Preface ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Design and dimensions of standard symbols **2**

5 Basic principles **2**
5.1 Basic symbols 2
5.1.1 Distinction between weld symbol and welding symbol 2
5.1.2 Illustrations 2
5.1.3 Basic weld symbols 2
5.1.4 Supplementary symbols 2
5.1.5 Standard location of elements of a welding symbol 2
5.2 Basic types of joints and welds 2
5.2.1 Basic types of joints 2
5.2.2 Applicable welds 3
5.3 General provisions 5
5.3.1 Location significance of arrow 5
5.3.2 Location of weld with respect to joint 7
5.3.3 Method of drawing symbols 8
5.3.4 Location of a specification, procedure, process, or other reference 8
5.3.5 Site weld symbol 9
5.3.6 Symbol for complete penetration from one side 9
5.3.7 Contour and surface finish methods for complete penetration from one side 11
5.3.8 Extent of welding denoted by symbols 11
5.3.9 Weld continuity 18
5.3.10 Finishing of welds 19
5.3.11 Construction of symbols 19
5.3.12 Crank in arrow 19
5.3.13 Reading of information on welding symbols 19
5.3.14 Combined weld symbols 19
5.3.15 Complete penetration 19
5.3.16 Designation of special types of weld 20
5.3.17 Multiple reference lines 20

6 Symbols for fillet welds **21**
6.1 General 21
6.1.1 Dimensioning fillets 21
6.1.2 Symbols with no general note 21
6.1.3 Symbols with general note 22
6.2 Size of fillet welds 22
6.2.1 Location 22
6.2.2 Unequal legs 22
6.2.3 Minimum size 22
6.2.4 Penetration 22
6.3 Length of fillet welds 22
6.3.1 Location 22
6.3.2 Abrupt changes 22
6.3.3 Specific lengths 25
6.4 Extent of fillet welding 25
6.4.1 Hatching 25
6.4.2 Welds beyond abrupt changes 25
6.5 Dimensioning of intermittent fillet welding 25
6.6 Termination of intermittent fillet welding 26
6.6.1 Intermittent fillets only 26

© Standards Australia Limited 2026

6.6.2 Intermittent welds between continuous welds ... 26
6.7 Combination of intermittent and continuous fillet welding ... 26
6.8 Fillet welds in holes and slots ... 26
6.9 Deep penetration fillet weld ... 26
6.10 Surface finish and contour of fillet welds ... 27
6.10.1 Contours obtained by welding ... 27
6.10.2 Flat contour by mechanical means ... 27
6.10.3 Convex contour by mechanical means ... 27
6.10.4 Concave contour by mechanical means ... 27
6.11 Skewed joints ... 28

7 Symbols for butt welds ... 28
7.1 General ... 28
7.1.1 Dimension location ... 28
7.1.2 Double-butt dimensions ... 28
7.1.3 Cranked arrow ... 29
7.1.4 Dimensions in general note ... 29
7.2 Depth of preparation and design throat thickness of butt welds ... 29
7.2.1 Location ... 29
7.2.2 Complete joint penetration required ... 29
7.2.3 Partial joint penetration specified, depth of preparation not specified ... 34
7.2.4 Depth of preparation specified, design throat thickness not specified, or specified elsewhere ... 35
7.2.5 Depth of preparation and design throat thickness specified ... 35
7.2.6 Special case of requirement of Clause 7.2.5 — Design throat thickness where specified less than depth of preparation ... 35
7.2.7 Joint preparation optional, complete penetration required ... 35
7.2.8 Joint preparation optional, design throat thickness specified ... 36
7.2.9 Flare-butt welds ... 37
7.2.10 Stake T-butt weld ... 39
7.3 Joint preparation dimensions ... 39
7.3.1 Root gap ... 39
7.3.2 Preparation angle ... 41
7.3.3 Radii and root faces ... 42
7.4 Surface finish and contour of butt welds ... 42
7.4.1 Contours obtained by welding ... 42
7.4.2 Flush contour by mechanical means ... 42
7.4.3 Convex contour by mechanical means ... 43
7.5 Backing run or backing welds ... 43
7.5.1 General ... 43
7.5.2 Backing run or backing weld symbol ... 43
7.5.3 Surface contour of backing run or backing welds ... 43
7.6 Joint with backing ... 46

8 Symbols for surfacing ... 47
8.1 General ... 47
8.2 Use of surfacing symbol ... 47
8.2.1 Symbol application ... 47
8.2.2 Arrow side significance ... 47
8.2.3 Dimension location ... 47
8.3 Size (thickness) of surfaces built up by welding ... 47
8.3.1 Minimum thickness ... 47
8.3.2 Unspecified thickness ... 47
8.4 Extent, location, and orientation of surfaces built up by welding ... 47
8.4.1 Entire area ... 47
8.4.2 Portion of area ... 47
8.5 Surfacing a weld face ... 49

9 Symbols for edge welding ... 49
9.1 General ... 49

© Standards Australia Limited 2026

9.2 Edge weld size 49
9.3 Single- and double-edge welds 49
9.4 Edge welds requiring complete joint penetration 49
9.5 Edge welds on joints with more than two members 49
9.6 Length of edge welds 49
9.7 Intermittent edge welds 50
9.7.1 Distance between weld elements 50
9.7.2 Weld element dimension location 50
9.7.3 Chain intermittent edge welds 50
9.7.4 Staggered intermittent edge welds 50
9.7.5 Extent of welding 50
9.7.6 Location of intermittent welds 50

10 Symbols for plug welding 53
10.1 General 53
10.1.1 Arrow side holes 53
10.1.2 Other side holes 53
10.1.3 Dimensions 54
10.1.4 Fillets in holes 54
10.2 Size of plug welds 54
10.3 Angle of countersink 54
10.4 Depth of filling 54
10.5 Spacing of plug welds 54
10.6 Surface contour of plug welds 55
10.6.1 Flush welds without finishing 55
10.6.2 Flush welds mechanically finished 55

11 Symbols for slot welding 56
11.1 General 56
11.1.1 Arrow side slots 56
11.1.2 Other side slots 56
11.1.3 Dimensions 57
11.2 Depth of filling 57
11.3 Details of slot welds 57
11.4 Surface finish and contour of slot welds 59
11.4.1 Flush welds without mechanical means 59
11.4.2 Flush welds mechanically finished 59

12 Symbols for spot welding 59
12.1 General 59
12.1.1 Arrow side significance 59
12.1.2 Dimension location 59
12.1.3 Process reference 60
12.1.4 Projection welds 61
12.2 Size and strength of spot welds 61
12.3 Spacing of spot welds 61
12.4 Extent of spot welding 61
12.5 Number of spot welds 63
12.6 Multiple-joint spot welds 63

13 Symbols for seam welding 63
13.1 General 63
13.1.1 Arrow side significance 63
13.1.2 Dimensions 63
13.1.3 Process reference 65
13.2 Size and strength of seam welds 65
13.3 Length of seam welds 67
13.3.1 Dimension location 67
13.3.2 Abrupt changes 67
13.3.3 Specific lengths 67

© Standards Australia Limited 2026

13.4 Dimensioning of intermittent seam welds 67
13.4.1 Distance between weld elements 67
13.4.2 Dimension location 67
13.5 Orientation of seam welds 68
13.5.1 Intermittent welds 68
13.5.2 Showing orientation 68
13.6 Flush seam-welded joints 68
13.7 Multiple-joint seam welds 68

14 Symbols for stud welding 69
14.1 Side significance 69
14.2 Stud size 69
14.3 Spacing of stud welds 69
14.4 Number of stud welds 69
14.5 Dimension location 69
14.6 Location of first and last stud welds 69

15 Symbols for brazed joints 70
15.1 General 70
15.2 Joint preparation 72

16 Symbols for non-destructive testing 73
16.1 Basic symbols 73
16.1.1 Basic test symbols 73
16.1.2 Elements of the test symbol 74
16.1.3 Standard location of elements 74
16.2 General provisions 75
16.2.1 Location significance of arrow 75
16.2.2 Location of test symbol 75
16.2.3 Direction of radiation 76
16.2.4 Combination of non-destructive testing symbols and welding symbols 76
16.2.5 Use of references 77
16.3 Methods of specifying extent of non-destructive testing 78
16.3.1 Specifying length of section to be examined 78
16.3.2 Specifying number of tests 78
16.3.3 Specifying tests made all around a joint 79
16.3.4 Specifying testing of parts (areas) 79
16.3.5 Acoustic emission 80

Appendix A (informative) **Abbreviations of terms for welding and allied processes 81**

Appendix B (normative) **Design of standard symbols 84**

© Standards Australia Limited 2026

Australian Standard®

Graphical symbols for general engineering

Part 3: Welding and non-destructive examination

1 Scope

This document describes symbols that provide the means of placing complete welding information on drawings. It covers the details of symbols and requirements for their application in various welding processes (including brazing), and non-destructive examination.

NOTE Appendix A gives a listing of abbreviations used for welding and allied processes.

2 Normative references

The following document is referred to in the text in such a way that some or all of its content constitutes requirements of this document.

AS 2812, *Welding, brazing and cutting of metals — Glossary of terms*

3 Terms and definitions

For the purpose of this document, the definitions given in AS 2812 and the following shall apply.

3.1
compound weld
butt-welded joint with a fillet weld superimposed on one or both faces

Note 1 to entry: The term “compound weld” is typically applied to T-butt weld geometry.

Note 2 to entry: The term “compound weld” is not applicable to deep-penetration fillet welds.

3.2
may
indicates the existence of an option

3.3
partial joint penetration
PJP
butt weld where, by design, fusion does not extend the full depth of the joint

3.4
shall
indicates that a statement is mandatory

3.5
should
indicates a recommendation

3.6
stake weld
weld in a T-joint where a laser beam or electron beam is irradiated from a horizontal plate/flange to vertical plate/web

Note 1 to entry: Vertical plates can be of different forms, e.g. folded plated or corrugated panels.

© Standards Australia Limited 2026