AS/NZS 2205.3.1:2024
ISO 5173:2023

Australian/New Zealand Standard™

Destructive tests on welds in metallic materials

Method 3.1: Bend tests (ISO 5173:2023, IDT)

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AS/NZS 2205.3.1:2024

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Australian Welding Institute
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Method 3.1: Bend tests (ISO 5173:2023, IDT)

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Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-003, Welding of Structures, to supersede AS/NZS 2205.3.1:2020.

The objective of this document is to specify a method for making transverse root, face and side bend tests on test specimens taken from butt welds, butt welds with cladding (subdivided into welds in clad plates and clad welds) and cladding without butt welds, in order to reveal imperfections on or near the surface of the test specimen which is under tension during bend testing and/or assess ductility. It also gives the dimensions of the test specimen.

In addition, this document specifies methods to be used instead of transverse bend tests with a former for welded joints when base materials, heat affected zones and/or weld metal have a significant difference in their physical and mechanical properties in relation to bending.

This document applies to metallic materials in all forms of product with welded joints made by any welding process.

This document is identical with, and has been reproduced from, ISO 5173:2023, *Destructive tests on welds in metallic materials — Bend tests.*

As this document has been reproduced from an International document, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

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

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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).

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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 5, *Testing and inspection of welds,* 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 fourth edition cancels and replaces the third edition (ISO 5173:2009) which has been technically revised. It also incorporates the Amendment ISO 5173:2009/Amd 1:2011.

The main changes are as follows:

— scope has been updated to introduce guided transverse bend tests with a roller and longitudinal bend tests as alternative methods of testing for heterogeneous assemblies;

— in Clause 4, the testing temperature has been removed;

— Subclause 7.2.2 has been modified accordingly;

— figures have been corrected;

— document has been aligned with the latest ISO/IEC Directives, Part 2.

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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Australian/New Zealand Standard

Destructive tests on welds in metallic materials

Method 3.1: Bend tests

1 Scope

This document specifies a method for making transverse root, face and side bend tests on test specimens taken from butt welds, butt welds with cladding (subdivided into welds in clad plates and clad welds) and cladding without butt welds, in order to reveal imperfections on or near the surface of the test specimen which is under tension during bend testing and/or assess ductility. It also gives the dimensions of the test specimen.

In addition, this document specifies methods to be used instead of transverse bend tests with a former for welded joints when base materials, heat affected zones and/or weld metal have a significant difference in their physical and mechanical properties in relation to bending.

This document applies to metallic materials in all forms of product with welded joints made by any welding process.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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/

3.1
transverse face bend test specimen for a butt weld
TFBB
transverse butt weld specimen where the face is in tension

Note 1 to entry: See Figure 1.

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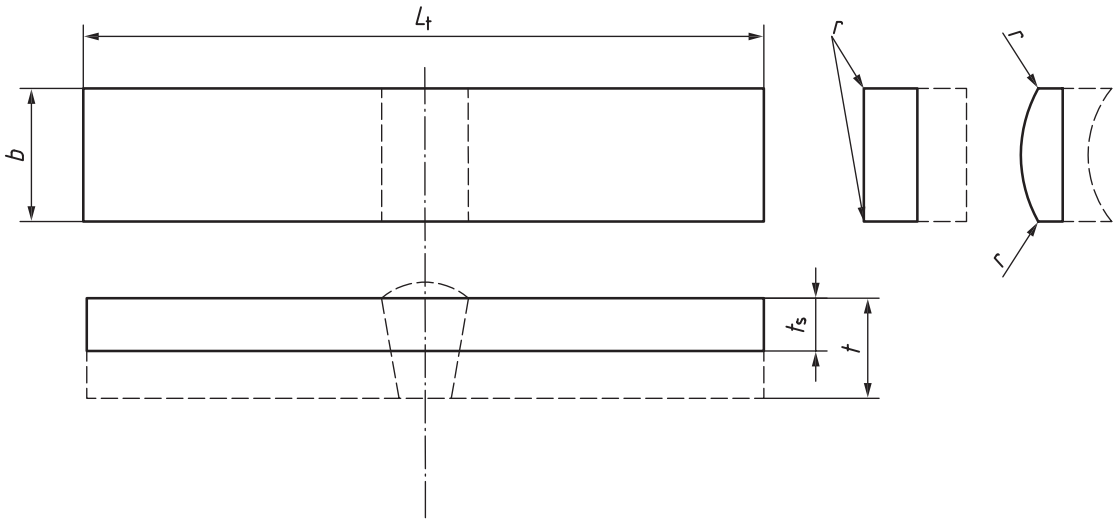
Dimensions in millimetres



Key

b width of the test specimen
L_t total length of the test specimen
r radius of the test specimen edges
t thickness of the test piece
t_s thickness of the test specimen

Figure 1 — Transverse face bend test specimen for a butt weld (TFBB)

3.2
transverse root bend test specimen for a butt weld
TRBB
transverse butt weld specimen where the root is in tension

Note 1 to entry: See Figure 2.

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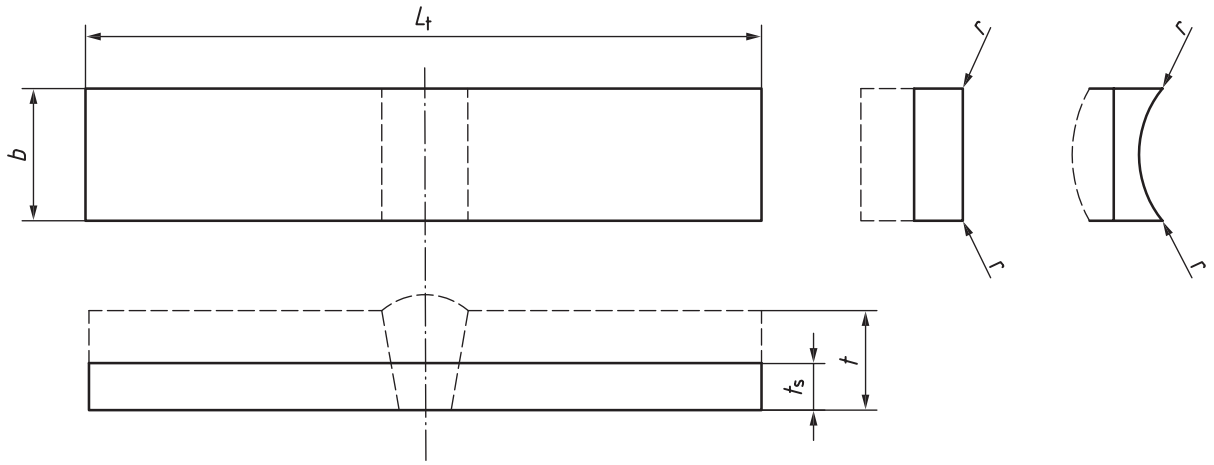
Dimensions in millimetres



Key

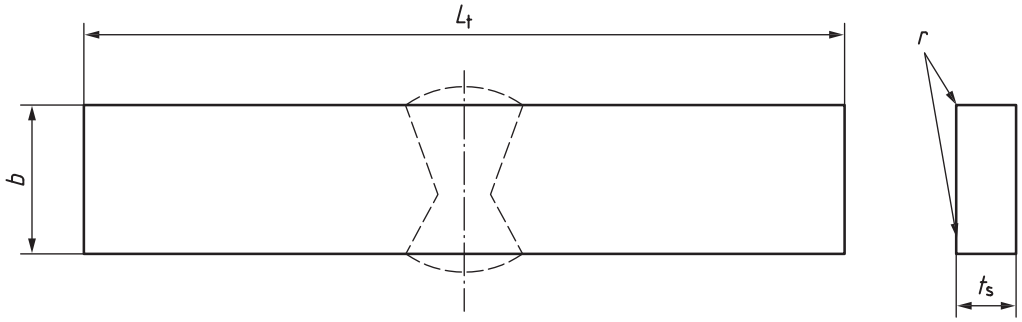
b width of the test specimen
L_t total length of the test specimen
r radius of the test specimen edges
t thickness of the test piece
t_s thickness of the test specimen

Figure 2 — Transverse root bend test specimen for a butt weld (TRBB)

3.3
transverse side bend test specimen for a butt weld
TSBB
specimen where the surface in tension is a cross-section of the weld

Note 1 to entry: See Figure 3.

Dimensions in millimetres



Key

b width of the test specimen
L_t total length of the test specimen
r radius of the test specimen edges
t_s thickness of the test specimen

Figure 3 — Transverse side bend test specimen for a butt weld (TSBB)

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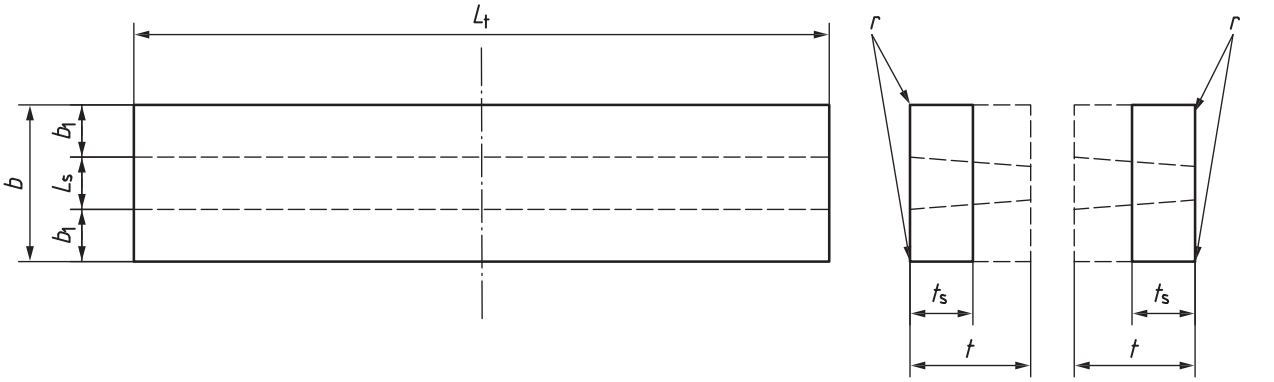
3.4
longitudinal face bend test specimen for a butt weld
LFBB
specimen where the direction is parallel to the butt weld direction and where the face is in tension

Note 1 to entry: See Figure 4

Dimensions in millimetres



Key

b width of the test specimen
L_s maximum width after machining
L_t total length of the test specimen
r radius of the test specimen edges
t thickness of the test piece
t_s thickness of the test specimen
b_1 width of outside fusion line

Figure 4 — Longitudinal face/root bend test specimen for a butt weld (LFBB and LRBB)

3.5
longitudinal root bend test specimen for a butt weld
LRBB
specimen where the direction is parallel to the butt weld direction and where the root is in tension

Note 1 to entry: See Figure 4.

3.6
face bend test specimen for cladding without a butt weld
FBC
specimen for which the cladding is in tension, applicable to both transverse and longitudinal specimens

Note 1 to entry: See Figure 5.

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