AS/NZS 2205.4.1:2019
ISO 9017:2017

Australian/New Zealand Standard™

Methods for destructive testing of welds in metal

Method 4.1: Fracture test

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This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee WD-003, Welding Of Structures. It was approved on behalf of the Council of Standards Australia on 11 January 2019 and by the New Zealand Standards Approval Board on 30 January 2019.

This Standard was published on 27 March 2019.

The following are represented on Committee WD-003:

Australasian Corrosion Association
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
New Zealand Heavy Engineering Research Association
New Zealand Non-Destructive Testing Association
Steel Reinforcement Institute of Australia
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This Standard was issued in draft form for comment as DR AS 2205.4.1:2018.

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ISBN 978 1 76072 386 6

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Originated in Australia as AS B301.5—1971.
Previous editions AS 2201.4.1—2003 and AS 2205.4.2—2005.
Jointly revised, amalgamated and redesignated as AS/NZS 2205.4.1:2019.

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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 2205.4.1—2003, *Methods for destructive testing of welds in metal, Method 4.1 Nick-break test* and AS 2205.4.2—2003, *Methods for destructive testing of welds in metal, Method 4.2: Fillet break test.*

The objective of this Standard is to specify the sizes of test specimen and the procedures for carrying out fracture tests in order to obtain information about types, sizes and distribution of internal imperfections such as porosities, cracks, lack of fusion, lack of penetration and solid inclusions on the fracture surface.

This Standard is identical with, and has been reproduced from, ISO 9017:2017, *Destructive tests on welds in metallic materials — Fracture test.*

As this document has been reproduced from an International Standard, 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 annexes to which they apply. A “normative” annex is an integral part of a Standard, whereas an “informative” 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).

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 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 the following URL: 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*.

This second edition cancels and replaces the first edition (ISO 9017:2001), which has been revised to update the normative references.

Request for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 5 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

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Australian/New Zealand Standard

Methods for destructive testing of welds in metal

Method 4.1: Fracture test

1 Scope

This document specifies the sizes of test specimen and the procedures for carrying out fracture tests in order to obtain information about types, sizes and distribution of internal imperfections such as porosities, cracks, lack of fusion, lack of penetration and solid inclusions on the fracture surface.

This document applies to metallic materials in all forms of product with joints made by any fusion welding process with a thickness greater or equal to 2 mm.

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 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 10042, *Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

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

3.1
examination length
L_f
length of the test specimen measured along the weld axis between any side notches

Note 1 to entry: See Figure 6.

3.2
total examination length
ΣL_f
sum of the lengths of all the test specimens comprising the test piece, measured along the weld axis, of the fracture faces between the side notches of the test specimens

Note 1 to entry: See Figure 6.

3.3
examination thickness
a_f
thickness of the fracture area for each test specimen

Note 1 to entry: See Figures 7 and 8.

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