AS/NZS 2205.5.1:2019
ISO 17639:2003

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Australian/New Zealand Standard™

Methods for destructive testing of welds in metal

Method 5.1: Macroscopic and microscopic examination of welds

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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 4 February 2019 and by the New Zealand Standards Approval Board on 30 January 2019.

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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 2205.5.1:2018.

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Originated as AS B301.7—1971.
Revised and redesignated as AS 2205.5.1—1980.
Fourth edition 2003.
Jointly revised and redesignated as AS/NZS 2205.5.1:2019.

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-003, Welding of Structures, to supersede AS 2205.5.1—2003, *Methods for destructive testing of welds in metal, Method 5.1: Macro metallographic test for cross-section examination*.

The objective of this Standard is to provide recommendations for specimen preparation, test procedures and their main objectives for macroscopic and microscopic examination.

Users of this Standard should be aware that its test methods include the methods specified in the superseded AS 2205.5.1 and now includes additional methods for microscopic examination not previously available.

This Standard is identical with, and has been reproduced from, ISO 17639:2003, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds.*

As this document has been reproduced from an International Standard, the following applies:

(a) In the source text "this International Standard" should read "this Australian/New Zealand Standard".

(b) 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.

Contents

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 17639 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 5, *Testing and inspection of welds*.

Requests for official interpretation of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 5 via the member body in the user's country, a complete listing of which can be found at www.iso.org.

Australian/New Zealand Standard

Methods for destructive testing of welds in metal

Method 5.1: Macroscopic and microscopic examination of welds

1 Scope

This International Standard gives recommendations for specimen preparation, test procedures and their main objectives for macroscopic and microscopic examination.

2 Normative references

The following referenced documents are indispensable for the application 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 6520-1, *Welding and allied processes — Classification of geometric imperfections in metallic materials — Part 1: Fusion welding*

ISO 9956-3, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for arc welding of steels*

ISO 9956-4, *Specification and approval of welding procedures for metallic materials — Part 4: Welding procedure tests for the arc welding of aluminium and its alloys*

ISO/TR 15608, *Welding — Guidelines for a metallic materials grouping system*

ISO/TR 16060, *Destructive tests on welds in metallic materials — Etchants for macroscopic and microscopic examination*

3 Terms and definitions

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

3.1
macroscopic examination
examination of a test specimen by the naked eye, or under low magnification (generally less than × 50), with or without etching

3.2
microscopic examination
examination of a test specimen by microscope with a magnification of generally × 50 to × 500, with or without etching

3.3
operator
person who performs the macroscopic and/or microscopic examination

4 Abbreviations

For the purposes of this document, the following abbreviations apply.

A Macroscopic examination

I Microscopic examination