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Australian Standard 2207—1980

METHODS FOR THE ULTRASONIC TESTING OF FUSION WELDED JOINTS IN STEEL



STANDARDS ASSOCIATION OF AUSTRALIA

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Atomic Energy Commission
Australian Institute for Non-Destructive Testing
Australian Welding Institute
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Department of Defence
Department of Labour and Industry, N.S.W.
Department of Labour and Industry, Victoria
Electricity Supply Association of Australia
Institute of Australian Foundrymen (N.S.W. Division)
National Association of Testing Authorities
Railways of Australia Committee
Society of Automotive Engineers—Australasia

This standard, prepared by Committee MT/7, Non-destructive Testing of Metals and Materials, was approved on behalf of the Council of the Standards Association of Australia on 27 March 1980, and was published on 1 July 1980.

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AUSTRALIAN STANDARD

**METHODS FOR THE
ULTRASONIC TESTING
OF FUSION WELDED JOINTS
IN STEEL**

AS 2207—1980

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PREFACE

This edition of this standard was prepared by the Association's Committee on Non-destructive Testing to replace the 1979 edition which was a revision of AS B261, Part 1—1968.

During the preparation of the 1979 edition the committee considered the testing methods written into overseas standards, and practices which have evolved in the field of non-destructive testing in Australia, including the following standards:

JIS Z2344	Ultrasonic Testing of Metals by the Pulse Echo Technique
BS 3889	Methods for Non-destructive Testing of Pipes and Tubes Part 1A—Ultrasonic Testing of Ferrous Pipes (excluding Cast)
AS 1710	Method for Ultrasonic Testing of Carbon and Low Alloy Steel Plate, and Classification of Quality

Consideration was also given to recommendations of the British Welding Institute and to technical literature on the subject, especially the work of Mr C. Abrahams of the United Kingdom. Acknowledgement is made of the assistance received from these sources.

The standard covers the use of pulse-echo ultrasonic testing equipment under direct contact conditions. It describes various test methods (using ultrasonic sound waves) which may be specified by manufacturers, inspecting authorities, or purchasers for the testing of welded structures.

The standard has been arranged in a new format and contains methods specified in more detail than previously. New methods have been introduced for the sizing of discontinuities based on a 20 dB intensity drop system.

Details and examples are given for the use of reflectivity diagrams for both normal and angle probes. A nomograph has also been included for different probe sizes when determining compensation for curvature.

Additional guidelines have also been introduced for use by purchasers, designers and testing authorities.

The standard has been written to include standard test methods. Methods which use grass, natural discontinuities or corner reflectors as reference or

calibration standards are considered to be non-preferred methods and have not been included because they cannot be related back to a 1.5 mm side-drilled hole because the response obtained may not be consistent.

The successful application of ultrasonic testing depends upon the technical competence of the testing personnel and on their ability to interpret test results. It is essential that testing personnel be conversant with the test equipment and be capable of demonstrating to the satisfaction of interested parties their technical competence and interpretive ability (see also Appendix A).

It is emphasized that diagnosis of the nature of discontinuities located by ultrasonic testing can be made only by consideration of both metallurgical and ultrasonic factors. Consideration should therefore be given to the method of welding, and the type, position and probable distribution of any discontinuities likely to be present. The procedure also depends upon the fact that a suitable design is essential, cooperation between designers and non-destructive testing specialists at an early stage is recommended.

It should be noted that facilities for non-destructive testing are afforded by laboratories registered by the National Association of Testing Authorities, Australia, for the field and class of testing covered by this standard.

To avoid unnecessary rejection of satisfactory welds this edition introduces a 20 percent threshold limit for Level 1 testing. Level 4 testing has been amended to provide for a threshold cut-off at 20 percent of the evaluation sensitivity.

To avoid possible confusion in the interpretation of requirements for surface preparation the requirements have been more carefully outlined.

Procedures for the testing of fillet welds in lap joints and web/flanges have also been updated.

This standard may require reference to the following Australian standards:

AS 1554	SAA Code for Welding in Building
AS 1929	Glossary of Terms Used in Non-destructive Testing
AS 2083	Calibration Blocks and their Method of Use in Ultrasonic Testing
AS Z5	Glossary of Metal Welding Terms

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