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# Non-destructive testing—Ultrasonic testing of steel castings and classification of quality

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This Australian standard was prepared by Committee MT/7, Non-destructive Testing of Metals and Materials. It was approved on behalf of the Council of the Standards Association of Australia on 8 September 1982 and published on 8 November 1982.

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The following interests were represented on the committee responsible for the preparation of this standard:

Australian Atomic Energy Commission
Australian Gas Association
Australian Institute for Non-destructive Testing
Australian Pipeline Industry Association
Australian Welding Institute
Bureau of Steel Manufacturers of Australia
Commonwealth Aircraft Corporation Limited
Confederation of Australian Industry
Department of Defence
Department of Industrial Relations, N.S.W.
Department of Labour and Industry, Victoria
Department of Productivity
Electricity Supply Association of Australia
Institute of Australian Foundrymen (N.S.W. Division)
Metal Trades Industry Association of Australia
National Association of Testing Authorities
Pipeline Authority
Railways of Australia Committee
Society of Automotive Engineers—Australasia

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# Non-destructive testing— Ultrasonic testing of steel castings and classification of quality

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# PREFACE

This standard was prepared by the Association's Committee for Non-destructive Testing of Metals and Materials at the request of the Metals Standards Board to provide suitable methods for the ultrasonic testing of steel castings.

During preparation of this standard, the committee considered the following documents:

| | |
|---|---|
| AS 1065 | Methods for Ultrasonic Testing of Ferritic Steel Forgings |
| BS 4080 | Methods for Non-destructive Testing of Steel Castings |
| ASTM A 609 | Standard Specification for Longitudinal-beam Ultrasonic Inspection of Carbon and Low Alloy Steel Castings |
| JIS Z2344 | Ultrasonic Testing of Metals by the Pulse Echo Technique |
| DIN 17245 | Ferritic Steel Castings Creep Resistance at Elevated Temperatures |
| Stahl-Eisen | Prufblatt 1922—Ultra Schall Prufung Von Gusstucken Aus Ferritischen Stahl |
| ISO/TC 17/SC11-N185 | Draft Proposal for the Ultrasonic Inspection of Steel Castings |
| B579/80599 | Draft Standard Inspection and Quality Limits for Steel Castings by Ultrasonic Means |
| | Atlas of Steel Casting Flaws as shown by Non-destructive Testing, The Steel Casting Research and Trades Association, Steel Founder Society of America |

Acknowledgement is made of the assistance obtained from these sources.

This standard follows the format adopted by the International Organization for Standardization (ISO) to provide methods of test and quality classifications as being suitable for Australian conditions and use. The standard covers the use of pulse-echo ultrasonic testing equipment under direct contact conditions. The methods described may be specified by the purchasers of castings, manufacturers and inspecting authorities.

The standard describes preferred and alternative methods of test and procedures for the sizing of discontinuities based on the amplitude reference method or last significant echo. Provision is also made for measurements of discontinuities to be carried out by the 20 dB intensity drop method.

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

Guidelines for purchasers, designers and testing authorities have been included in an appendix. Because of the importance of technical competence and experience in the ultrasonic testing of castings, reference should be made to information on Testing Authorities given in Appendix A.

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