AS 2452.3—2005

Australian Standard™

Non-destructive testing—Determination of thickness

Part 3: Use of ultrasonic testing

This Australian Standard was prepared by Committee MT-007, Non-destructive Testing of Metal and Materials. It was approved on behalf of the Council of Standards Australia on 20 October 2005.
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The following are represented on Committee MT-007:

Australian Railway Association
Australian Aerospace Non-Destructive Testing Committee
Australian Industry Group
Australian Institute for Non-Destructive Testing
Australian Nuclear Science & Technology Organisation
Australian Pipeline Industry Association
Bureau of Steel Manufacturers of Australia
Engineers Australia
Industrial Research Limited
National Association of Testing Authorities Australia
New Zealand Non-Destructive Testing Association
TestSafe Australia
Victorian WorkCover Authority
Welding Technology Institute of Australia

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Non-destructive testing—Determination of thickness

Part 3: Use of ultrasonic testing

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standard New Zealand Committee MT-007, Non-destructive Testing of Metals and Materials, at the request of industry. This Standard supersedes AS 2452.3—1985, *Non-destructive testing—Determination of thickness,* Part 3: *Use of ultrasonic testing.*

After consultation with shareholders in both countries, Standards Australian and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this edition was to delete references to obsolete technology such as analog equipment and to revise the method of determining thickness by the use of correction factors.

This Standard is Part 3 of a series of Standards covering the methods used for determining thickness by means of non-destructive procedures.

The series comprises the following Parts:

AS	
2452	Non-destructive testing—Determination of thickness
2452.1	Part 1: Determination of wall thickness of pipe by the use of radiography
2452.3	Part 3: Use of ultrasonic testing

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance

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1 SCOPE

This Standard specifies six methods for the determination of thickness of material based on the use of ultrasonic pulse-echo principles where scanning and reflecting surfaces are substantially parallel. The methods are as follows:

(a) Single spot—single measurement (SS).

(b) Single spot—double measurement (SD).

(c) Multiple spot measurements (MS).

(d) Close grid survey method (CG).

(e) Open grid method (OG).

(f) Scanning runs (SR).

(g) Complete coverage method (CC).

NOTES:

1 Appendix A provides guidelines on information to be provided to the manufacturer at the time of enquiry.

2 Factors affecting the results and order of accuracy achieved are given in Appendix D.

2 APPLICATION

Methods described in this Standard are suitable for the determination of thickness of materials where surface temperature is within the range of –10°C to 60°C and where the velocity of sound through the material is either known or can be determined.

The methods (SS, SD, MS, GG, and OG) may be used where surface temperature is lower than –10°C, or higher than 60°C, but in such cases special precautions are required.

The methods may also be used where Base Line Survey or Key Point Survey concepts are applied as follows:

(a) *Base Line Survey* Base Line Survey entails the measurement of components at nominated locations on new items or alternatively at the time of commissioning of new plant. Results can then be kept on record for comparison against subsequent measurements taken after service use. In addition, initial survey results can be compared to nominated design or drawing thicknesses for construction checking purposes.

(b) *Key Point Survey* Key Point Survey entails routine repeat testing at specific nominated positions on operating components. The locations of key test points are usually determined from anticipated performance characteristics of the component or alternatively from the performance history of the component. Duration between surveys is similarly determined. The Key Point Survey concept allows component performance to be monitored in terms of section loss at the test location, thus allowing maintenance and repair scheduling to be carried out on an ordered basis.

