AS 2824—2003
Reconfirmed 2017

Australian Standard™

Non-destructive testing—Ultrasonic methods—Evaluation and quality classification of metal bearing bonds (ISO 4386-1:1992, MOD)

Standards Australia

This Australian Standard was prepared by Committee MT-007, Non-Destructive Testing of Metals and Minerals. It was approved on behalf of the Council of Standards Australia on 11 August 2003 and published on 18 September 2003.

The following are represented on Committee MT-007:

Australasian Railway Association
Australasian Aerospace Non-Destructive Testing Committee
Australian Industry Group
Australian Institute for Non-Destructive Testing
ANSTO
Australian Pipeline Association
Bureau of Steel Manufacturers of Australia
Institute of Engineers
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TestSafe Australia
Victoria Workcover
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This Standard was issued in draft form for comment as DR 03320.

STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 2824—2003
Non-destructive testing—Ultrasonic methods—Evaluation and quality classification of metal bearing bonds (ISO 4386-1:1992, MOD)

RECONFIRMATION NOTICE

Technical Committee MT-007 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 2 March 2017.

The following are represented on Technical Committee MT-007:

Australasian Thermographers Association
Australian Aerospace Non-Destructive Testing Committee
Australian Institute for Non-Destructive Testing
Australian Nuclear Science & Technology Organisation
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Bureau of Steel Manufacturers of Australia
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New Zealand Non-Destructive Testing Association
TestSafe Australia
Welding Technology Institute of Australia
WorkSafe Victoria

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Australian Standard™

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee MT-007, Non-Destructive Testing of Metals and Materials to supersede AS 2824—1985. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard is an adoption with national modifications and is reproduced from ISO 4386-1:1992, *Plain bearings—Metallic multilayer plain bearings,* Part 1: *Non-destructive ultrasonic testing of bond.*

Variations to the ISO text for Australia are set out in Appendix ZZ. Changes to the ISO text are indicated by a marginal bar. Variations include—the reference block complying with ISO 2400 and ISO 7963 in Clause 8.1.2 is replaced by AS 2083, Calibration block number 5; ISO Clause 11 has been changed to conform with established Australian practices for non-destructive ultrasonic testing of bond; and requirements for the qualifications of non-destructive examination personnel have been applied in a new Clause 12.

As this Standard is reproduced from an international Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text 'this part of ISO 4386' should read 'this Australian Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

References to international Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
ISO		AS	
2400	Welds in steel—Reference block for the calibration of equipment for ultrasonic examination	2083	Calibration blocks and their methods of use in ultrasonic testing (See Appendix ZZ)
4386	Plain bearings—Metallic multilayer plain bearings		
4386-2	Part 2: Destructive testing of bond for bearing metal layer thickness greater than or equal to 2 mm	—	
4386-3	Part 3: Non-destructive penetrant testing	—	
7963	Welds in steel—Calibration block No 2 for ultrasonic examination of welds	2083	Calibration blocks and their methods of use in ultrasonic testing (See Appendix ZZ)

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' annex and appendix are integral parts of the Standard, whereas an 'informative' appendix is only for information and guidance.

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Non-destructive testing—Ultrasonic methods—Evaluation and quality classification of metal bearing bonds (ISO 4386-1:1992, MOD)

1 Scope

This part of ISO 4386 specifies an ultrasonic testing method for determining bond defects between the bearing metal and the backing. The test can be performed on metallic multilayer plain bearings consisting of backings lined with bearing metal based on lead and tin, with layer thicknesses greater than or equal to 0,5 mm.

The test is not possible within half the diameter of the crystal from the edges of the bearing, oil holes, grooves, etc. because of undefined reflections. In bearings with dovetail keying grooves at the bond, the test may not be possible along the edges of the dovetails. Evaluation of the bond between the bearing backing and bearing material on the end faces and joint faces is possible by the penetrant testing method specified in ISO 4386-3.

Within the meaning of this part of ISO 4386, the ultrasonic method only permits a qualitative evaluation of the bonding and not a quantitative determination of the bond strength as specified in ISO 4386-2.

This part of ISO 4386 only describes in detail the pulse-echo method in which the probe is applied from the bearing metal side. When the probe is applied from the backing side, the signals are to be treated analogously.

The sound energy reflected by the bond surface area between the bearing metal and the backing is used to determine the quality of the bonding.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 4386. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4386 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2400:1972, *Welds in steel — Reference block for the calibration of equipment for ultrasonic examination.*

ISO 4386-2:1982, *Plain bearings — Metallic multilayer plain bearings — Part 2: Destructive testing of bond for bearing metal layer thicknesses greater than or equal to 2 mm.*

ISO 4386-3:1992, *Plain bearings — Metallic multilayer plain bearings — Part 3: Non-destructive penetrant testing.*

ISO 7963:1985, *Welds in steel — Calibration block No. 2 for ultrasonic examination of welds.*

3 Symbols

The following symbols are used on the figures in this part of ISO 4386.

IS	Input signal
BE	Bond echo
WE	Back-wall echo
RE	Reference echo