AS 4169—2004
Reconfirmed 2017

Australian Standard™

Electroplated coatings—Tin and tin alloys (ISO 2093:1986, MOD)

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee MT-009, Metal Finishing. It was approved on behalf of the Council of Standards Australia on 27 January 2004 and published on 16 March 2004.

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Australian Institute of Metal Finishing
Australian Aluminium Council
Australian Industry Group
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This Standard was issued in draft form for comment as DR 03643.

STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 4169—2004
Electroplated coatings—Tin and tin alloys (ISO 2093:1986, MOD)

RECONFIRMATION NOTICE

Technical Committee MT-009 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.

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Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 20 March 2017.

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Australian Chamber of Commerce and Industry
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Bureau of Steel Manufacturers of Australia
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Galvanizing Association of New Zealand
New Zealand Metal Roofing Manufacturers

NOTES

Australian Standard™

Electroplated coatings—Tin and tin alloys (ISO 2093:1986, MOD)

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee MT-009, Metal finishing to supersede AS 4169—1994, *Electroplated coatings—Tin and tin alloys*.

After consultation with stakeholders in both counties, 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 2093:1986 *Electroplated coatings of tin—Specification and test methods.*

Variations to the ISO text for Australia are set out in Appendix ZZ. Changes to the ISO text are indicated by marginal bars.

This Standard is a modification of ISO 2093:1986 in which an additional clause has been included to prevent metallic whisker growth.

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 International Standard' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by Australian Standards, as follows:

References to International Standard		*Australian Standard*	
ISO		AS	
1463	Metallic and oxide coatings—Measurement of coating thickness—Microscopical method	2331	Methods of test for metallic and related coatings
		2331.1.1	Method 1.1: Local thickness tests—Micrographic examination of cross-sections
2177	Metal coatings—Measurement of coating thickness—Coulometric method by anodic dissolution	2331.1.2	Method 1.2: Local thickness tests—Coloumetric methods
2819	Metallic coatings on metallic substrates—Electrodeposited and chemically deposited coatings—Review of methods available for testing adhesion	2331.4.1	Physical tests—Qualitative adhesion tests
2859	Sampling procedures and tables for inspection by attribute	1199	Sampling procedures for inspection by attributes
		1199.1	Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.
3543	Metallic and non-metallic coatings—Measurements of thickness—Beta backscatter method	2331.1.5	Method 1.5: Local thickness tests—Beta back-scatter method

References to International Standard		*Australian Standard*	
ISO		AS	
3768	Metallic coatings—Neutral salt spray test (NSS test)	2331.3.1	Method 3.1: Corrosion and related property tests—Neutral salt spray (NSS) test

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix or annex 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.

NOTES

AUSTRALIAN STANDARD

Electroplated coatings—Tin and tin alloys (ISO 2093:1986, MOD)

0 Introduction

This International Standard specifies requirements for electroplated coatings of tin on fabricated metal articles to protect them from corrosion and to facilitate soldering.

Attention is drawn to legislative requirements that exist in many countries for tin coatings used in the food industry.

Annex C gives additional information as guidance to the user.

It is essential that the purchaser should state the information itemized in 4.1 and, if appropriate, 4.2. Specifying ISO 2093 without this information is insufficient.

1 Scope and field of application

This International Standard specifies requirements for electroplated coatings of nominally pure tin on fabricated metal articles. The coatings may be dull or bright as electroplated or may be flow-melted by fusion after electroplating.

It does not apply to

a) threaded components;

b) tin-coated copper wire;

c) coatings on sheet, strip or wire in unfabricated form, or on articles made from them;

d) coatings on coil springs;

e) coatings applied by chemical means (immersion, autocatalytic or "electroless");

f) electroplating of steels with tensile strength greater than 1 000 MPa[1] (or of corresponding hardness), because such steels are subject to hydrogen embrittlement (see 8.2).

2 Reference

ISO 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method.*

ISO 2064, *Metallic and other non-organic coatings — Definitions and conventions concerning the measurement of thickness.*

ISO 2177, *Metallic coatings — Measurement of coating thickness — Coulometric method by anodic dissolution.*

ISO 2819, *Metallic coatings on metallic substrates — Electrodeposited and chemically deposited coatings — Review of methods available for testing adhesion.*

ISO 2859, *Sampling procedures and tables for inspection by attributes.*[2]

ISO 3497, *Metallic coatings — Measurements of coating thickness — X-ray spectrometric methods.*

ISO 3543, *Metallic and non-metallic coatings — Measurements of thickness — Beta backscatter method.*

ISO 3768, *Metallic coatings — Neutral salt spray test (NSS test).*

ISO 4519, *Electrodeposited metallic coatings and related finishes — Sampling procedures for inspection by attributes.*

ISO 6988, *Metallic and other non-organic coatings — Sulfur dioxide test with general condensation of moisture.*

IEC Publication 68-2-20, *Basic environmental testing procedures — Test T: Soldering.*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1 significant surface: The part of the article covered or to be covered by the coating and for which the coating is essential for serviceability and/or appearance.

(Definition taken from ISO 2064.)

3.2 flow-melting; fusing; flow-brightening; reflowing: A process by which a coating is melted in order to impart desirable properties such as brightness or improved solderability (see clause C.4).

1) 1 MPa = 1 N/mm^2

2) At present at the stage of draft. (Revision of ISO 2859-1974.)