

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2331.2.1—2001

Methods of test for metallic and related coatings

**Method 2.1: Local thickness tests—Tests for average coating mass per unit area or
for thickness—Dissolution methods—Strip and weigh, and analytical**

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.

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 20 March 2017.

The following are represented on Technical Committee MT-009:

Australasian Institute of Surface Finishing
Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Steel Institute
Bureau of Steel Manufacturers of Australia
Galvanizers Association of Australia
Galvanizing Association of New Zealand
New Zealand Metal Roofing Manufacturers

NOTES

Australian Standard™

AS 2331.2.1

Methods of test for metallic and related coatings

Method 2.1: Tests for average coating mass per unit area or for thickness—Dissolution methods—Strip and weigh, and analytical

1 SCOPE

This Standard sets out the following three methods for the determination of the average mass or thickness of metallic coatings on small items:

- (a) Method A—Strip and weigh (dissolution of coating).
- (b) Method B—Strip and weigh (dissolution of basis metal).
- (c) Method C—Analytical.

These methods are suitable for measuring the average thickness, or mass, of coatings on small items where it is impracticable to measure the local thickness as described in AS 2331.1.1, AS 2331.1.2, AS 2331.1.3 or AS 2331.1.4.

The methods are suitable for routine control purposes where a more critical local thickness measurement is not required.

The methods are capable of an accuracy of $\pm 5\%$.

The methods are generally limited to items or a collection of items that weigh not more than 200 g.

NOTE: The test procedures described in this Standard do not necessarily include all of the precautions required to satisfy health and safety aspects. Care should be taken to ensure that the procedures are carried out only by people who have received suitable training. Guidance in the handling and use of hazardous chemicals is given in AS/NZS 2243.1 and AS/NZS 2243.2.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|----------|---|
| 2331 | Methods of test for metallic and related coatings |
| 2331.1.1 | Method 1.1: Local thickness tests—Micrographic examination of cross-sections |
| 2331.1.2 | Method 1.2: Local thickness tests—Coulometric method |
| 2331.1.3 | Method 1.3: Local thickness tests—Magnetic method |
| 2331.1.4 | Method 1.4: Local thickness tests—Magnetic induction and eddy current methods |

AS/NZS

- | | |
|--------|--------------------------|
| 2243 | Safety in laboratories |
| 2243.1 | Part 1: General |
| 2243.2 | Part 2: Chemical aspects |

3 PRINCIPLE

The principle of each method is as follows:

(a) *Method A*

Coated items are weighed and the coating is stripped from the basis metal without any appreciable attack on the basis metal. Items are washed, dried and reweighed.

(b) *Method B*

Coated items are weighed and the basis metal removed without any appreciable attack on the coating. The coating is then rinsed, dried and weighed.

(c) *Method C*

The coating mass is determined by dissolving the coating, with or without dissolving the basis metal, and determining the quantity of coating metal by chemical analysis.

4 REAGENTS

The test reagents listed in Table 1 are known to perform satisfactorily.

5 PREPARATION OF TEST PIECES

5.1 General

Test pieces shall be thoroughly cleaned before testing. The cleaning method employed shall depend on the nature of the surface and the contaminants, and shall not include the use of any abrasives or solvents that may attack the coating.

Care shall be taken to ensure that test pieces are not recontaminated by excessive or careless handling after cleaning.

NOTE: Freshly coated items are preferred because there is less risk of contamination by foreign matter.

5.2 Surface area

The area of the coated surface shall be determined to within an accuracy of $\pm 5\%$.

NOTES: The following procedures have been found useful for determining the area of irregularly shaped items:

- (a) Attach masking tape over the entire surface without overlap; peel the tape from the surface and transfer it to a sheet of graph paper. Then compute the area in square millimetres.
- (b) After suitable preparation and weighing, coat the test piece, together with a regular-shaped control test specimen of known surface area, with electroless nickel. (The test piece and the control specimen should be immersed simultaneously and removed simultaneously from the electroless nickel bath.).

Reweight the test piece and the control specimen and determine the increase in their mass.

As increases in mass are proportional to their respective areas, compute the area of the test piece, in square millimetres.

6 PROCEDURE

6.1 Method A—Strip and weigh (dissolution of coating) method

The following procedure shall be used:

- (a) Weigh the test piece(s) to within 1 mg.
- (b) Immerse the test piece(s) in an appropriate stripping reagent.
- (c) As soon as the coating has been stripped from the basis metal, remove the test piece(s) and wash to remove the stripping solution.