STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TEST FOR METALLIC AND RELATED COATINGS

PART 2—AVERAGE THICKNESS TESTS

AS 2331.2.1—1980
DISSOLUTION METHODS—STRIP AND WEIGH, AND ANALYTICAL

1 SCOPE. This standard sets out three methods for the determination of the average thickness of metallic coatings on small items:

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

Method B— Strip and weigh (dissolution of basis metal) method.

Method C— Analytical method.

2 APPLICATION. These methods are suitable for measuring the average thickness of coatings on small items where it is impracticable to measure the local thickness as described in AS 2331.1.1, 1.2, 1.3 or 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 ±5 percent.

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

NOTE: These methods exclude the determination of coating thickness on items that have had a supplementary treatment such as lacquering following the metallic coating process.

3 PRINCIPLE. The principle of each method is as follows:

(a) *Method A.* Coated items are weighed and the coating 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 upon the coating. The coating is then raised, 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 free of foreign matter and, if necessary, shall be degreased in a solvent that does not attack the coating. Any supplementary treatment shall be removed before carrying out the determination.

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 5 percent.

NOTE: 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 to a sheet of graph paper. Then compute the area in square millimetres.

(b) After suitable preparation and weighing, coat the test piece along with a regular shaped control test specimen with a coating of electroless nickel.
The test piece and the control specimen should be immersed simultaneously and removed simultaneously from the electroless nickel bath.
The test piece and the control specimen are reweighed and the increase in mass determined.
Increases in mass are proportional to their respective areas.

6 PROCEDURE. The mass of the coating shall be determined by one of the methods described in Clauses 6.1 to 6.3.

6.1 Method A—Strip and Weigh (Dissolution of Coating) Method.

(a) Weigh the test piece(s) to within 1 mg.

(b) Immerse the test piece(s) in the appropriate stripping reagent.

(c) As soon as the coating has been stripped from the basis metal, remove the test piece(s) from the test reagent and wash to remove the stripping solution.

(d) Rinse in ethanol to assist water removal.

(e) Dry in an oven and cool.

(f) Reweigh stripped test piece(s) to within 1 mg.

6.2 Method B—Strip and Weigh (Dissolution of Basis Metal) Method.

NOTE: This method is appropriate where the coating remains undissolved by the stripping reagent.

(a) Immerse the test piece(s) in an appropriate reagent which dissolves the basis metal but does not affect the coating itself.

(b) As soon as the basis metal has been dissolved filter off the coating residue.

(c) Rinse, dry and weigh the coating.