

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TEST FOR METALLIC AND RELATED COATINGS

PART 2—AVERAGE THICKNESS TESTS

AS 2331.2.2—1980

TIME OF GASSING METHOD

1 SCOPE. This standard sets out the method for the measurement of the average thickness of electroplated coatings by the time taken to dissolve the coating as evidenced by the evolution of hydrogen gas.

2 APPLICATION. The method is suitable for use as a process control method for the testing of coatings which are too large to weigh.

The method is capable of an accuracy of ± 10 percent.

3 PRINCIPLE. The area of the coated surface is treated with an acid which rapidly dissolves the coating and liberates a considerable quantity of hydrogen gas. The period of the duration of gassing is corrected for temperature as a function of the thickness of the deposit.

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

5 PREPARATION OF TEST PIECES. Test pieces shall be free of foreign matter and, if necessary, shall be degreased in a solvent that does not attack the coating.

The test area on large items should be appropriately masked off and then rubbed with a paste of freshly prepared magnesium oxide and washed clean.

TABLE 1
TEST REAGENTS

Reagent	Coating system
Nickel sulphate ($\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$) 10 g Hydrochloric acid (ρ_{20} 1160 kg/m ³) 100 mL	Cadmium on steel
Antimony trioxide (Sb_2O_3) 20 g Hydrochloric acid (ρ_{20} 1160 kg/m ³) 1 L	Chromium on nickel

6 PROCEDURE. The coating thickness shall be determined as follows:

- (a) Apply a quantity of acid to the test surface and record the time in seconds from the commencement of the evolution of gas to the completion of the liberation of gas.

NOTE: Sufficient acid is required to be applied to the test surface to ensure that the complete time of gassing is carried out in one operation.

- (b) Record the temperature of the stock reagent.
(c) The thickness of the coating may be obtained from the appropriate graph (see Fig. 1 or Fig. 2).

7 TEST REPORT. The test report shall include the following information:

- (a) Test piece identification.
(b) Relevant product specification.
(c) Thickness of the coating, in micrometres.
(d) Number of this Australian standard, i.e. AS 2331.2.2.
(e) Report number and date.