

DETERMINATION OF THE QUALITY OF SEALING OF ANODISED ALUMINUM

Application

This method is used to quantitatively determine the quality of sealing of anodized aluminum by measurement of weight loss after immersion in acidified sodium sulphite solution.

Apparatus and Reagents Required
(of recognized analytical quality)**Analytical Balance**

Accuracy +/- 0.5 mg

pH Meter**Hot Plate**

Thermostatically controlled 90 - 92 °C

Glass Beakers

1 and 2 liters

Acidified Sodium Sulphite Solution

10 gm sodium sulphite (anhydrous) in 1 liter of distilled or deionized water to which glacial acetic acid (20 mL/liter to 40 mL/liter) has been added to give pH 3.6 to pH 3.8 followed by addition of 5 N Sulphuric acid (10 mL/liter to 15 mL/liter to give pH 2.5 at 23 +/- 2 °C).

Nitric Acid Solution

Nitric acid (Sp Gr 1.42), 50 % by volume aqueous solution.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Date	Action	Revisions
2001 01 31	Revised	Editorial – no technical change A. Cockman
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Procedure

1. Measure total surface area of the test sample in square decimeters – cut edges and unanodised areas are excluded. The test sample surface area should not be less than 0.375 dm² or greater than 3 dm².
2. Remove surface bloom by rubbing with a dry cloth. If samples are finger marked or are in any way greasy, they should be wiped over with a suitable organic solvent.
3. Weigh the clean test sample to the nearest 1 mg.
4. Immerse the clean test sample in the nitric acid solution at a temperature of 20 +/- 2 °C for 10 minutes.
5. Rinse thoroughly in running water and then in distilled or deionised water. Forced air dry (oil and water free), paper towels may be used to assist this process, and weigh the sample to an accuracy of 1 mg.
6. Immerse the sample for 20 minutes in the acidified sulphite solution maintained at a temperature of 90 - 92 °C. A fresh test solution should be made up and used for each test. (Care must be taken that the solution temperature does not at any time exceed 92 °C or the sulphur dioxide in the solution will be lost).
7. Rinse thoroughly in distilled or deionised water, forced air dry (oil and water free), paper towels may be used to assist this process, and weigh the sample to an accuracy of 1 mg.

Evaluation

The loss of mass per unit of surface area, p, expressed in milligrams per square decimetre, is given by the formula

$$p = \frac{p^1}{S}$$

Where P¹ is the total loss of mass, in milligrams

S is the surface area in contact with the solution, excluding the edges, in square decimetres.