



Designation: F 1110 – 90 (Reapproved 1998)

Standard Test Method for Sandwich Corrosion Test¹

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1. Scope

1.1 This test method defines the procedure for evaluating the corrosivity of materials on aluminum alloys commonly used for aircraft structures. This test method is intended to be used in the qualification and approval of compounds employed in aircraft maintenance operations.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazard statements appear in Section 9.

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

D 1748 Test Method for Rust Protection by Metal Preservatives in the Humidity Cabinet³

G 46 Guide for Examination and Evaluation of Pitting Corrosion⁴

2.2 Federal Specifications:

QQ-A-250/4 Al Alloy 2024 Plate and Sheet⁴

QQ-A-250/5 Al Alloy Alclad 2024 Plate and Sheet⁴

QQ-A-250/12 Al Alloy 7075 Plate and Sheet⁴

QQ-A-250/13 Al Alloy Alclad 7075 Plate and Sheet⁴

2.3 Military Specification:

MIL-A-8625 Anodic Coatings for Aluminum and Al Alloys^{4,5}

3. Terminology

3.1 Definition of Term Specific to This Standard:

3.1.1 *sandwich corrosion test*—a comparative accelerated environmental test of the corrosivity of liquid or solid materials on structural aluminum alloys commonly used in aerospace construction.

4. Summary of Test Method

4.1 Aluminum coupons having clad or anodized nonclad surfaces are sandwiched together with a filter paper saturated with the test material between the coupons. The sandwiched coupons are cycled between warm ambient air and warm humid air for 7 days. The coupons are then inspected to determine whether corrosion more severe than that caused by reagent water has occurred on the surfaces exposed to the test material. This test method may be used for solutions of dry granular material or for liquid materials.

5. Significance and Use

5.1 The data generated by this test method shall be used to determine whether aircraft structural aluminum alloys are liable to be corroded or damaged by application of the test material during routine maintenance operations.

5.2 Interpretation of the sandwich corrosion test results is based on a comparison of the appearance of faying surfaces of three sets of coupons. One set of test coupons is exposed with reagent water only in the faying surfaces, to establish the baseline (controls) against which the panels exposed to the test material are compared. Corrosion at cut edges of the test coupons should be disregarded.

5.3 The relative corrosion severity rating system is provided in order to allow a numerical classification of the test results and to eliminate the necessity for elaborate weight loss measurements. Pitting corrosion, which is rated 4—extensive (severe) corrosion, may involve only a negligible weight loss.

5.4 Relative corrosion severity rating system

0—No visible corrosion

1—Very slight corrosion or discoloration

2—Slight corrosion

3—Moderate corrosion

4—Extensive corrosion or pitting

0—No corrosion

1—Up to 5 % of the surface area corroded

2—5 to 10 %

3—10 to 25 %

4—25 % or more

6. Interferences

6.1 Tap water containing large amounts of dissolved solids, especially chlorides, may cause relative severe corrosion of the aluminum control panels. For this reason a reagent water is specified. For comparative purposes, a set of aluminum test panels, with the locally available tap water applied to the filter

¹ This test method is under the jurisdiction of ASTM Committee F-7 on Aerospace and Aircraft and is the direct responsibility of Subcommittee F07.07 on Qualification Testing of Aircraft Cleaning Materials.

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 05.01.

⁴ *Annual Book of ASTM Standards*, Vol 03.02.

⁵ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.