



Designation: F 1111 – 88 (Reapproved 1998)

## Standard Test Method for Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals<sup>1</sup>

This standard is issued under the fixed designation F 1111; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method is intended as a means of determining the corrosive effects of aircraft maintenance chemicals on low-embrittling cadmium plating used on aircraft high-strength steel, under conditions of total immersion by quantitative measurements of weight change.

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.* For specific hazard statements see Section 6 and Note 1 and Note X1.1.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 329 Specification for Acetone<sup>2</sup>

D 740 Specification for Methyl Ethyl Ketone<sup>2</sup>

D 1193 Specification for Reagent Water<sup>3</sup>

#### 2.2 Military Specification:

MIL-S-18729 Steel Plate, Sheet and Strip, Alloy 4130<sup>4</sup>

#### 2.3 Federal Specification:

O.T. 620 Specification for 1,1,1-Trichloroethane, Technical Inhibited (Methyl) Chloroform<sup>4</sup>

### 3. Significance and Use

3.1 The data generated by this test method shall be used to determine whether low embrittling cadmium plated parts are liable to be corroded or damaged by application of the test material during routine maintenance operations.

### 4. Apparatus

4.1 *Wide Mouth Sealable Glass Jar or Stoppered Flask*, having a capacity so chosen that specimens will remain fully immersed in a vertical position and not in contact with other

specimens during the test and the ratio of area of immersed metal to the volume of solution will be as prescribed in 9.1.

NOTE 1—**Caution:** Some aircraft maintenance chemicals when heated have high vapor pressures or may produce gases during testing. Suitable precautions should be taken to prevent the containing vessel from exploding or the vessel should be so chosen as to withstand the resulting pressures.

4.2 *Constant Temperature Device*—Any suitable regulated heating device may be employed for maintaining the solution at the required temperature.

4.3 *Sandblaster*.

4.4 *Ampere Meter*, capable of measuring  $60 \pm 5$  A.

4.5 *Oven*, capable of maintaining temperature of  $110 \pm 2^\circ\text{C}$  ( $230 \pm 4^\circ\text{F}$ ).

4.6 *Plating Bath*, containing the solution specified in X1.2.

### 5. Reagents

5.1 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water as defined by Type III of Specification D 1193.

5.2 *Trichloroethane*, conforming to Federal Specification O.T. 620.

5.3 *Methyl Ethyl Ketone*, conforming to Specification D 740.

5.4 *Acetone*, conforming to Specification D 329.

5.5 *Aluminum Oxide*, 180 grit.

### 6. Safety Precautions

6.1 The solvents used in cleaning test specimens are flammable or harmful if inhaled, or both. Keep away from sparks and open flames. Avoid breathing vapors and prolonged or repeated contact with skin. Use adequate ventilation.

6.2 Cyanides and cadmium oxide are very toxic and corrosive to skin. Take suitable precautions in the handling of them to avoid personal injury. Use adequate ventilation and keep away from acids.

6.3 Some materials used for aircraft maintenance may contain flammable solvents, acids or alkalis, or other toxic compounds. Take suitable precautions to prevent personal injury.

### 7. Test Specimens

7.1 The test specimens shall be made of 4130 steel in

<sup>1</sup> 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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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.04.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 11.01.

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