Designation: D 1730 – 67 (Reapproved 1998)

Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting[1]

This standard is issued under the fixed designation D 1730; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These practices cover four types of treatment for preparation of aluminum and aluminum-alloy surfaces for painting, as follows:

1.1.1 Type A—Solvent Cleaning.

1.1.2 Type B—Chemical Treatments.

1.1.3 Type C—Anodic Treatments.

1.1.4 Type D—Mechanical Treatments. These four types cover a number of procedures, as described herein.

1.2 Variations in surface treatment produce end conditions which differ, and which do not necessarily yield identical results when paints are applied. Service conditions will dictate the type of surface preparation that should be selected, although the quality produced by any individual method may vary with different alloys.

1.3 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 609 Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Lacquer, Conversion Coatings and Related Coating Products[2]

3. Type A—Solvent Cleaning

3.1 Solvent cleaning does not disturb the natural oxide film on the metal and may prove adequate for some applications, such as ambient indoor or very mild service conditions. Three methods may be employed, as follows:

3.1.1 *Method 1, Manual Swabbing or Dip-Washing*, with a solvent such as mineral spirits or high-flask solvent naphtha. With this method it is extremely difficult to prevent accumulation of contaminants on the swab or in the solvent. This method is only recommended when other treatments are impractical.

3.1.2 *Method 2, Solvent Spray Cleaning*, in accordance with Method A, Procedure 1 of Practice D 609.

3.1.3 *Method 3, Vapor Degreasing*, in special equipment employing trichloroethylene vapor, in accordance with Method A, Procedure 2 of Practice D 609.

4. Type B—Chemical Treatments

NOTE 1—Materials and procedures employed in these methods of treatment are available from a number of sources as proprietary compounds or methods. Selection may be made from available sources.

4.1 *Method 1, Alkaline Cleaners*—Alkaline solutions, such as caustic soda, etch the metal, thus destroying the natural oxide film. They are followed by an acid treatment, preferably nitric acid or phosphoric acid. They shall not be used on assembled structures. Inhibited alkaline cleaners are sometimes employed as a pretreatment to remove grease and oil prior to an acid treatment. Inhibited alkaline cleaners do not etch the surface. They are not generally recommended unless followed by a conversion treatment, such as described in Methods 4, 5, 6, or 7.

4.2 *Method 2, Sulfuric Acid, Chromium Trioxide Etch*—This treatment provides a clean and uniform surface without undue etching, and is effective for removing oil and water stains and any film formed during heat-treatment. The etching solution is prepared by adding 1 gal (3.78 L) of concentrated sulfuric acid and 45 oz (1.28 kg) of chromium trioxide to 9 gal (34 L) of water. It is used at a temperature of 160 to 180°F (71 to 82°C) (depending on the alloy and the amount of film) for about 5 min and is followed by a water rinse. This treatment produces a passive surface suitable for painting under mild to intermediate exposure conditions and where clear finishes are to be applied.

4.3 *Method 3, Alcoholic Phosphoric Acid Cleaner*—This treatment involves the use of an aqueous solution of phosphoric acid (10 to 15 volume %) with alcohol or other organic solvents, together with wetting agents, emulsifying agents, etc. The solution may be applied by swabbing or dipping at room

[1] These practices are under the jurisdiction of ASTM Committee B-8 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommitee B08.07 on Chemical Conversion Coatings.

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[2] *Annual Book of ASTM Standards,* Vol 06.01.