AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 2471A

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ANODIC TREATMENT OF ALUMINUM BASE ALLOYS
Sulfuric Acid Process

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: To increase corrosion resistance and provide surfaces which will ensure satisfactory adherence of paint and other organic finishes. This process is not suited for parts or assemblies which contain joints or recesses in which the anodizing solution may be retained.

3. PREPARATION: Parts prior to being coated shall have clean surfaces prepared with minimum abrasion, erosion, or pitting. Cleaning by a process giving a slightly etched surface is desirable.

4. SOLUTIONS:

4.1 Electrolyte: Shall be an aqueous solution of sulfuric acid of suitable concentration (nominal concentration is 15%). The temperature of the anodizing solution shall be maintained at 64 - 75 F (17.8 - 23.9 C) except when parts are to be dyed in which case a temperature of 75 - 85 F (23.9 - 29.4 C) is permissible.

4.2 Sealer: Unless otherwise specified, shall be an aqueous solution containing 5 - 6% by weight sodium or potassium dichromate. The sealer solution shall be maintained at a pH value of 4.5 - 6.0 and a temperature of 190 - 210 F (87.8 - 98.9 C). Adjustments in the acidity of the sealer solution shall be made by the addition of chromic acid.

5. PROCEDURE:

5.1 The cleaned parts shall be made the anode in the electrolyte contained in a suitable metal tank which may also serve as the cathode. Direct current shall be applied as required to produce an anode current density of 10 - 15 amp per sq ft for 15 - 30 min. as required to produce an anodic coating conforming to the specified technical requirements. Other conditions of time, temperature, and amperage may be used when approved by purchaser. After anodizing, all parts shall be rinsed thoroughly in cold running tap water.

5.2 Parts shall be immersed in the sealer solution for not less than 20 minutes. After sealing, all parts shall be rinsed thoroughly in clean cold running tap water, then in clean hot water, and dried.

6. TECHNICAL REQUIREMENTS:

6.1 Coating Weight: Shall be not less than 600 mg per sq ft on parts which are not to be dyed and not less than 2500 mg per sq ft on parts which are to be dyed but routine determinations are not required. If parts are of such size or shape that ø surface area cannot readily be determined, coating weight determinations may be made on separate specimens not less than 3 x 3 in. in width and length and 0.025 - 0.063 in. thick but routine determinations are not required; separate specimens, when used, shall be of an alloy of the same class as the parts represented, as follows:

Class 1. Alloys of commercial designations 1100, 3003, 3004, 5052, 6053, 6061, 6062, 6063, and all clad alloys.

Class 2. All wrought alloys not listed as class 1 and all casting alloys.

Separate specimens shall be processed with the work they represent. Determinations of coating weight shall be made in accordance with ASTM B137-45 on parts or specimens which have been anodized and rinsed but not sealed or dyed.

6.1.1 If small parts such as rivets and machine screws are anodized in bulk in a container, the specified coating weight shall apply to not less than 75% of the ø parts treated together, determined by random sampling, but in no case shall any part show uncoated areas.

6.2 Corrosion Resistance:

6.2.1 For control purposes, samples of AMS 4037 sheet 0.040 in. thick and not less than 3 x 10 in. (the 10 in. dimension being perpendicular to the direction of rolling) treated in accordance with Section 5 shall withstand 250 hr exposure to salt spray without corroding to the extent that would cause more than 5% decrease in tensile strength and 10% decrease in elongation from those of duplicate treated but unexposed panels; in no case shall a corroded specimen have ø tensile strength lower than 62,000 psi or elongation lower than 12%. The salt spray corrosion test shall be conducted in accordance with ASTM B117-49T. Test results for both exposed and unexposed panels shall be reported as the average of three specimens from each panel. Tensile test specimens shall conform to ASTM E8-54T. The foregoing test is not required when material or parts treated in accordance with Section 5 are subsequently painted.

6.2.2 Each part that is anodized and not subsequently painted shall be capable of withstanding salt spray test conducted in accordance with ASTM B117-49T for 250 hr without showing more than a few scattered visual corrosion pits.

7. PRECAUTIONS:

7.1 Surfaces to be painted should be handled with care after anodizing to prevent rupture of the film and contamination by dirt or oil before painting, which should be performed as soon after treatment as practicable.