AEROSPACE
MATERIAL SPECIFICATIONS

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AMS 2475B
Superseding AMS 2475A

Issued 3-14-40
Revised 11-1-67

PROTECTIVE TREATMENTS
Magnesium Base Alloys

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

2. PURPOSE: Primarily to increase corrosion resistance and provide surfaces which will insure maximum paint adherence.

3. PREPARATION:

3.1 Machined and fabricated parts shall be thoroughly cleaned to remove dirt, grease, and oil before treatment. Such contamination may be removed by vapor degreasing or equivalent method or by alkaline cleaners. Alkaline cleaners will produce a more uniform color.

3.2 If rough castings show oxidation, they shall be dipped for 10 sec in a solution at room temperature containing by volume 90 parts of water, 8 parts of concentrated nitric acid (specific gravity 1.42), and 2 parts of concentrated sulfuric acid (specific gravity 1.84) then washed thoroughly in cold, running water followed by a dip in hot water and drying rapidly.

3.3 Die lubricant and/or oxide film on stampings, forgings, or die castings, or on finished parts where close dimensional tolerances are required, shall be removed by immersing for 1 - 15 min. in an aqueous solution containing approximately 1-1/2 lb of chromic acid (CrO_3) per gal and operated at 190 - 212 F (87.8 - 100 C), then washing thoroughly in cold, running water followed by a dip in hot water and drying rapidly.

4. DICHROMATE TREATMENT:

4.1 Application: This treatment shall be used on finished parts made from either cast or wrought alloys, except as in 5.1.2 and 5.4 and except those with high manganese content. Unless otherwise permitted, it shall be applied after all external and internal machining operations and before assembly with aluminum, aluminum alloy, or cadmium plated parts. Parts machined or marred after this treatment shall be chrome-pickled or treated by a proprietary process as in Section 5.

4.2 Solutions:

4.2.1 A water solution containing 15 - 20% by weight of hydrofluoric acid (HF).

4.2.2 A water solution containing 10 - 15% of sodium dichromate ($Na_2Cr_2O_7 \cdot 2H_2O$) and 0.25% of magnesium fluoride (MgF_2) by weight. The solution shall be maintained in a saturated condition with respect to the magnesium fluoride by continuous immersion of a cloth bag or equivalent containing the compound.

4.3 Temperatures: The hydrofluoric acid solution shall be operated at room temperature. The sodium dichromate solution shall be operated at not lower than 200 F (93 C) and preferably at its boiling point.

4.4 Procedure:

4.4.1 The cleaned parts shall be immersed in the hydrofluoric acid solution for not less than 5 min. and then rinsed thoroughly in cold, running water.

4.4.2 The wet parts shall be immersed in the sodium dichromate solution for not less than 30 min. and then rinsed thoroughly in cold, running water, dipped in hot water, and dried rapidly with a clean, dry air blast. Properly applied finish will vary from dark brown to black depending upon the alloy composition, condition of solution, and length of time of treatment.

5. CHROME-PICKLE TREATMENT:

5.1 Application: This treatment is applicable as follows:

5.1.1 It shall be used for local touch-up of previously dichromate-treated parts where additional finishing has been necessary after painting or where surfaces have been marred during other operations.

5.1.2 It may be used for finished parts where dimensional tolerances permit.

5.2 Solution:

Sodium Dichromate ($Na_2Cr_2O_7 \cdot 2H_2O$)	1.5 lb
Nitric Acid (HNO_3, sp gr 1.42)	1.5 pt
Water to make	1.0 gal

5.3 Procedure: The surfaces or local areas to be treated shall be flooded continuously with freshly prepared chrome-pickle solution by flowing, brushing, or swabbing, or shall be immersed in the solution at room temperature. Time of treatment shall, when dimensional tolerances permit, be 1/2 - 2 min.; in other cases, time of treatment shall be as long as practicable without removing metal in excess of dimensional tolerances. Parts shall then be rinsed thoroughly with clean, running water and dried with a clean, dry air blast.

5.4 Ø Proprietary solutions may be used for treatment of complete parts or for touch-up provided they perform the same function as the touch-up solution in 5.2.

6. PRECAUTIONS:

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

6.2 Surfaces of all solutions should be kept clean to prevent films collecting on the parts when they are immersed in the tank or are removed therefrom.

6.3 In handling hydrofluoric acid, great care should be taken to avoid contact with the skin; rubber gloves and protective clothing should be worn by the operators.

7. REPORTS: Unless otherwise specified, the vendor shall furnish with each shipment of coated parts three copies of a report stating that the parts have been processed in accordance with the requirements of this Ø specification. This report shall include the purchase order number, specification number, part number, and quantity.

Ø8. APPROVAL:

8.1 To assure adequate performance characteristics, coated parts shall be approved by purchaser before parts Ø for production use are supplied, unless such approval be waived.