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AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

SAE AMS 2486B

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CONVERSION COATING OF TITANIUM ALLOYS
Fluoride-Phosphate Type

1. **SCOPE:**

1.1 **Purpose:** This specification establishes the engineering requirements for producing chemical conversion coatings on titanium alloys and the properties of such coatings.

1.2 **Application:** Primarily to provide a coating which is receptive to anti-galling and organic finishes.

2. **APPLICABLE DOCUMENTS:** The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 **SAE Publications:** Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 **Aerospace Material Specifications:**

AMS 2350 - Standards and Test Methods

2.2 **U.S. Government Publications:** Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.2.1 **Federal Specifications:**

O-H-795 - Hydrofluoric Acid, Technical
O-S-642 - Sodium Phosphate, Tribasic, Technical, Anhydrous, Dodecahydrate, and Monohydrate

3. TECHNICAL REQUIREMENTS:

3.1 Conversion Bath: Shall consist of an aqueous solution of the following materials in the concentrations shown:

Trisodium Phosphate (Na_3OP_4 * $12H_20$) conforming to O-S-642, 6.5 - 6.9 oz per gal (49 - 51.5 g/L)

Potassium Fluoride ($KF*2H_20$), 2.3 - 3.2 oz per gal (17.5 - 24 g/L)

Hydrofluoric Acid (60% by weight HF) conforming to O-H-795, 1.7 - 2.9 oz per gal (13.5 - 22.5 mL/L)

3.2 Preparation:

3.2.1 Masking: Remove or mask off dissimilar metal inserts and mask areas not to be treated,

3.2.2 Cleaning: Clean parts free of oil, grease, dirt, mill markings, heat treatment scale, and other soils prior to immersion in the chemical conversion bath.

3.3 Procedure:

Coating: Parts shall be immersed in the conversion bath, maintained at 80°F ± 10 (27°C ± 5), for 2 - 4 min, in a manner which will ensure complete coverage of all areas to be coated.

3.3.2 Rinsing: Coated parts shall be rinsed by immersion in a circulating water bath, maintained at a temperature not higher than 185°F (85°C). Rinse time shall be not longer than 16 min. when rinse water temperature is above 100°F (38°C).

3.3.2.1 Dissolved solids content of circulating rinse water shall be maintained below 200 ppm at all times.

3.3.3 Drying: Dry parts for not less than 30 min. in air at 150° - 200°F (65° - 95°C).

3.3.4 Handling: Dried parts shall be handled only with clean, dry gloves.

3.4 Properties: Coating shall conform to the following requirements:

3.4.1 Appearance: The coating shall be gray in color but color intensity or uniformity shall not be used as a basis for judging coating quality.

3.4.2 Adhesion: Coating shall be adherent to basis metal when parts are wiped with a clean, cotton cloth. Parts showing indications of heavy powdering or of coating removal during wiping are not acceptable.

3.4.3 Water Spotting: Random staining, due to water spotting, which does not exceed 5% of the part area is acceptable.

3.5 Quality: Coating shall be uniform in quality and condition, free from Ø blisters, pits, and foreign materials and from imperfections detrimental to usage of the coating.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of coated parts shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that processing conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and as preproduction tests and shall be performed prior to or on the initial shipment of processed parts to a purchaser, on each lot of processed parts, when a change in material, part design, or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to berequired.

4.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be not less than the following; a lot shall be all parts of the same part number, processed in a continuous operation, or within one 24-hr period, and presented for vendor's inspection at one time:

4.3.1 Coverage and Appearance: All parts in lot.

4.3.2 Adherence: Three parts per lot.

4.3.3 Water Spotting: Three parts per lot.

4.4 Approval:

4.4.1 Sample coated parts and the vendor's facilities and procedures shall be approved by purchaser before parts for production use are supplied, unless such approval be waived by purchaser. Results of tests on production parts shall be essentially equivalent to those on the approved sample parts.

4.4.2 Vendor shall use processing cycles, equipment, environment, and methods of inspection for production parts which are essentially the same as those used on the approved sample parts. If necessary to make any change in type of equipment, processing cycles, environment, or methods of inspection, vendor shall submit for reapproval of the process a statement of the proposed changes in processing and, when requested, sample coated parts, test panels, or both. Production parts coated by the revised procedure shall not be shipped prior to receipt of reapproval.