Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 2480C
Superseding AMS 2480B

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PHOSPHATE TREATMENT
Paint Base

1. SCOPE:

1.1 Purpose: This specification covers the engineering requirements for producing a phosphate coating on ferrous alloys and the properties of the coating.

1.2 Application: Primarily to produce a coating which will ensure satisfactory paint adherence.

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

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 3120 - Enamel, Glyceryl Phthalate, Black Baking

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B117 - Salt Spray (Fog) Testing

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Preparation:

3.1.1 All heat treatment, machining, forming, brazing, welding, and perforating operations shall, Ø insofar as practicable, be completed before parts are treated.

3.1.2 Parts, prior to being treated, shall have chemically clean surfaces, free from waterbreaks, Ø prepared with minimum abrasion, erosion, or pitting.

3.2 Procedure: Parts shall be coated by immersing in, or spraying with, a balanced phosphate solution containing nitrate as an accelerating agent. The solution shall be maintained at the proper temperature and parts shall be held in contact with the solution for sufficient time to form a uniform, insoluble crystalline phosphate coating meeting the requirements of 3.4. Immediately after such processing, parts shall be thoroughly rinsed in cold, running water.

3.3 Post Treatment: After the cold water rinse, parts shall be dipped for 20 - 60 sec in dilute chromic acid solution (7.5 oz per 100 gal (0.56 g/L) solution, approximate pH of 5) at 190° F ± 10 (88° C ± 5), and dried. Parts shall be protected against contamination and shall be painted as soon as practicable.

3.4 Properties: The coating shall conform to the following requirements:

3.4.1 Color: Coated parts and test panels shall have a uniform, dull appearance ranging from light to dark gray, with or without some silvery iridescence.

3.4.2 Corrosion Resistance: Representative parts or test panels shall show no visual evidence of corrosion of the basis metal extending more than 1/8 in. (3 mm) on either side of scratch marks after being prepared as in 3.4.2.1 and subjected for 150 hr to continuous salt spray corrosion test conducted in accordance with ASTM B117.

3.4.2.1 Representative parts or test panels processed with parts as in 3.2 and 3.3 shall be coated with one coat of AMS 3120 enamel to a film thickness of 0.0004 - 0.0010 in. (10 - 25 μm), air dried for 15 min. ± 1, baked at 295° - 305° F (145° - 150° C) for 30 min. ± 1, and air dried for 24 hr ± 1. Parts or test panel shall be scratched with a sharp instrument to a depth which will cut through the enamel film.

3.5 Quality: Surfaces of treated parts shall be uniform in texture and appearance. Powdery areas, excessive buildup, and darkening of corners and edges are not acceptable.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The processing vendor shall supply all samples 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 perform such confirmatory testing as he deems necessary to ensure that processing conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for color (3.4.1) and quality (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for corrosion resistance (3.4.2) are classified as periodic tests and shall be performed at a frequency selected by the processing vendor unless frequency of testing is specified by purchaser.

4.2.3 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed on the initial shipment of coated parts to a purchaser, when a change in processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.3.1 For direct U.S. Military procurement, substantiating test data and, when requested, Ø 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 as agreed upon by purchaser and vendor; a lot shall be all parts processed in the Ø same solution in not longer than 8 hr of continuous operation and presented for vendor's inspection at one time.

4.3.1 When coated parts are of such configuration or size as to be not readily adaptable for the Ø specified tests, separate test specimens cleaned, coated, and post-treated with the parts they represent may be used. Such specimens shall be panels of annealed, low-carbon steel approximately 0.032 x 4 x 2 in. (1 x 100 x 50 mm).

4.4 Approval:

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

4.4.2 Vendor shall use manufacturing procedures, processes, and methods of inspection on production parts which are essentially the same as those used on the approved sample parts. If any change Ø is necessary in type of equipment or in established composition limits and operating conditions of process solutions, 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.

4.5 Reports: The vendor of coated parts shall furnish with each shipment three copies of a report Ø stating that the parts have been processed and tested in accordance with the requirements of this specification and that the parts conform to the acceptance test requirements. This report shall include the purchase order number, this specification number and its revision letter, part number, and quantity.

4.6 Resampling and Retesting: If any part or specimen used in the above tests fails to meet the Ø specified requirements, disposition of the parts may be based on the results of testing three additional parts or specimens for each original nonconforming part or specimen. Except as specified in 4.6.1, failure of any retest part or specimen to meet the specified requirements shall be cause for rejection of the parts represented and no additional testing shall be permitted. Results of all tests shall be reported.

4.6.1 If any part or specimen fails to meet the specified requirements, either on the original sampling Ø as in 4.3 or upon resampling as in 4.6, the parts in that lot may be stripped by a method approved by purchaser which does not roughen, pit, or embrittle the basis metal, recoated, and retested.

5. PREPARATION FOR DELIVERY:

5.1 Parts shall be handled and packaged in such a manner as will ensure that the required physical Ø characteristics and properties of the coated parts are preserved.

5.2 Packages of parts shall be prepared for shipment in accordance with commercial practice and in Ø compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the coated parts to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.