



400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard



AMS 2480F

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Superseding AMS 2480E

PHOSPHATE TREATMENT Paint Base

1. SCOPE:

1.1 Form:

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

1.2 Application:

This process has been used typically to produce a coating which will ensure satisfactory paint adherence, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 117 Operating Salt Spray (Fog) Testing Apparatus

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2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-P-23377 Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant

MIL-P-85582 Primer Coatings: Epoxy, VOC Compliant, Chemical and Solvent Resistant

3. TECHNICAL REQUIREMENTS:

3.1 Preparation:

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

3.1.2 Surfaces of parts, prior to phosphate coating, shall have surfaces free from waterbreaks.

3.2 Procedure:

Parts shall be coated by immersing in, or spraying with, a balanced phosphate solution containing a nitrate salt 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 coating, parts shall be thoroughly rinsed in cold, running water.

3.3 Post Treatment:

After the cold water rinse, parts shall be dipped in dilute chromic acid solution for 20 to 60 seconds at $190^{\circ}\text{F} \pm 10$ ($88^{\circ}\text{C} \pm 6$), and dried. The chromic acid solution shall be made up of 7.5 ounces of chromic acid in 100 gallons of water (0.56 g/L) with an approximate pH of 5. Other post treatments may be used in place of the chromic acid dip, if approved by the cognizant engineering organization. After drying, 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 Coverage: Prior to post treatment, coated parts and test panels shall have a uniform, dull appearance ranging from light to dark gray, with or without some silvery iridescence.

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3.4.2 Corrosion Resistance: Representative parts or test panels (See 4.3.3) processed with parts as in 3.2 and 3.3, coated with either MIL-P-23377 or MIL-P-85582 to a film thickness of 0.0004 to 0.0010 inch (10 to 25 μm) and cured in accordance with manufacturer's instructions, scratched with a sharp instrument to a depth that cuts through the primer film, shall show no visual evidence of corrosion extending more than 1/8 inch (3.2 mm) on either side of the scratch mark after being subjected to 150 hours of continuous salt spray conducted in accordance with ASTM B 117.

3.5 Quality:

Surfaces of treated parts, as received by purchaser, 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 processor shall supply all samples for processor's tests and shall be responsible for performing all required tests. Parts, if required for tests, shall be supplied by purchaser. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the processing conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Coverage (3.4.1) and quality (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Corrosion resistance (3.4.2) and tests of cleaning and coating solutions to ensure that coatings will conform to this specification are periodic tests and shall be performed at a frequency selected by the processor unless frequency of testing is specified by purchaser, but not less than monthly for corrosion testing.

4.2.3 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of coated parts to a purchaser, when a change in materials or processing requires reapproval by the cognizant engineering organization (See 4.4.2), and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing:

Shall be as follows; a lot shall be all parts with the same part number, heat treated to the same hardness or tensile strength level, processed in the same solution(s) within eight consecutive hours, and presented for processor's inspection at one time.

4.3.1 For Acceptance Tests: As shown in Table 1.

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TABLE 1 - Acceptance Test Sampling

Number of Parts in Lot	Coverage and Quality
Up to 6	All
7 to 15	7
16 to 40	10
41 to 110	15
111 to 300	25
301 to 500	35
501 to 700	50
701 to 1200	75
over 1200	125

4.3.2 Preproduction and Periodic Tests: Sample quantity and frequency of sampling shall be selected at the discretion of the processor, except for corrosion testing, unless otherwise specified by purchaser.

4.3.3 When coated parts are of such configuration or size as to be not readily adaptable for the specified tests, separate test specimens fabricated from low carbon steel, cleaned, coated, and post-treated with the parts may be used. Specimens shall be panels 0.032 x 4 x 2 inches (0.81 x 102 x 51 mm).

4.4 Approval:

4.4.1 The process and control procedures, a preproduction sample part, or both, whichever is specified, shall be approved by the cognizant engineering organization before production parts are supplied. Preproduction test specimens may be substituted for a preproduction sample part at the discretion of the cognizant engineering organization.

4.4.2 The processor shall make no significant change to materials, processes, coating conditions or control factors from those on which the approval was based, unless the change is approved by the cognizant engineering organization. A significant change is one which, in the judgment of the cognizant engineering organization, could affect the properties or performance of the parts.

4.4.2.1 Control factors include, but are not limited to the following:

- Bath type and control limits
- Bath temperature controls and limits
- Post-treatment solution type and control limits
- Stripping procedure, if used
- Periodic test plan