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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 2480E

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Superseding AMS 2480D

Submitted for recognition as an American National Standard

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 product 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 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 3120 Enamel, Glyceryl Phthalate, Black Baking

Printed in U.S.A.
91-0942/ EG

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 117 Salt Spray (Fog) Testing

2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements

3. TECHNICAL REQUIREMENTS:

3.1 Preparation:

3.1.1 All heat treatment, machining, forming, brazing, welding, and perforating operations shall, 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, 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 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 such processing, 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 °F ± 10 (88 °C ± 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. 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 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 inch (3.2 mm) on either side of scratch marks after being prepared as in 3.4.2.1 and subjected for 150 hours to a continuous salt spray corrosion test conducted in accordance with ASTM B 117.

3.4.2.1 (R) Representative parts or test panels, made of an alloy of the same class as the parts represented, 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 to 0.0010 inch (10 to 25 μm), air dried for 15 minutes ± 1, baked at 295 to 305 °F (146 to 152 °C) for 30 minutes ± 1, and air dried for 24 hours ± 1. Parts or test panels shall be scratched with a sharp instrument to a depth which will cut through the enamel film.

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 (R) Responsibility for Inspection:

The processing vendor shall supply all samples for vendor's tests and shall be responsible for performing all required tests. 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:

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

4.2.2 Periodic Tests: Tests for corrosion resistance (3.4.2) are 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 for all technical requirements of this specification are preproduction tests and shall be performed prior to or 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, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling and Testing:

(R)

Shall be as agreed upon by purchaser and vendor; a lot shall be all parts made of the same basis material, heat treated to the same hardness or tensile strength level, processed in the same solution(s) in not longer than eight consecutive hours, and presented for vendor's inspection at one time.

4.3.1 (R) When coated parts are of such configuration or size as to be not readily adaptable for the specified tests, separate tests specimens fabricated from the same basis material as the parts they represent, 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 (R) 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 (R) The supplier shall make no significant change to materials, processes or controls 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.

4.5 Reports:

The vendor of coated parts shall furnish with each shipment a report stating that the parts have been processed and tested in accordance with the requirements of this specification and that they conform to the acceptance test requirements. This report shall include the purchase order number, lot number, AMS 2480E, part number, and quantity.

4.6 Resampling and Retesting:

If any part or specimen used in the above tests fails to meet the 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. 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 as in 4.3 or upon resampling as in 4.6, the parts in that lot may be stripped by a method acceptable to purchaser which does not roughen, pit, or embrittle the basis metal, recoated, and retested.