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AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS 2485G

An American National Standard

BLACK OXIDE COATING

1. SCOPE:

1.1 Purpose:

This specification covers the engineering requirements for producing black oxide coatings on parts and the properties of such coatings.

1.2 Application:

This coating has been used typically to increase the anti-chafing and anti-friction properties of carbon and low-alloy steel parts, particularly sliding or bearing surfaces, by providing a finish coating which will retain an oil film, 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 applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

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2.1 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 Parts should be finish machined, inspected, and deemed acceptable for uncoated parts by the parts manufacturer before being treated.

3.1.2 The parts to be coated shall have chemically clean surfaces, free from water-breaks, prepared with minimum abrasion, erosion, and pitting. Parts showing a water-break shall be recleaned before being coated.

3.2 Procedure:

3.2.1 The properly cleaned parts, while still wet, shall be immersed in one or more boiling aqueous alkali oxidizing baths for such times and at such temperatures (See 8.2) as will produce coatings meeting the requirements of 3.3 and 3.4.

3.2.2 Coated parts shall be washed thoroughly in running tap water to remove all traces of processing solution and deposited salts. Parts shall not be allowed to dry during the entire sequence of operations until completion of this rinse.

3.2.3 Parts shall be thoroughly dried unless a water-displacing oil is used in 3.2.4 in which case complete drying may be omitted.

3.2.4 Parts shall be dipped in a suitable corrosion-preventive oil.

3.3 Properties:

Coated parts shall conform to the following requirements:

3.3.1 Smut Test. Coatings on parts before oiling as in 3.2.4, or on oiled parts after vapor degreasing, shall show no indications of reddish-brown or green smut when wiped with a clean, white cloth.

3.4 Quality:

3.4.1 Except as otherwise specified herein, the coating on polished surfaces (R) all be a uniformly lustrous black. Coating on other surfaces shall be black or dark gray in color, uniform on areas of equivalent surface roughness. Coating on all types of surfaces shall be free of spots of red oxide or an overall reddish-brown color but an overall reddish-brown cast on a basically black color is permissible. Standards for acceptance shall be as agreed upon by purchaser and vendor taking into consideration the factors mentioned in 8.3. Coating shall be continuous, smooth, dense, and adherent and shall not rub off under any conditions incident to normal handling or storage.

3.4.2 No measurable dimensional changes shall result from processing.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

(R)

The vendor of coated parts 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:

(R)

Tests for all technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of coated parts to a purchaser, on each lot, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

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, contracting officer, or request for procurement.

4.3 Sampling and Testing:

(R)

Shall be not less than the following; a lot shall be all parts made of the same 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 Smut Test: Three pieces from each lot.

4.3.2 Quality: All parts.

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 by purchaser. Results of tests on production coated parts shall be essentially equivalent to those on the approved sample parts.