



AEROSPACE MATERIAL SPECIFICATION

AMS2426™**REV. F**

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Superseding AMS2426E

Coating, Cadmium
Vacuum Deposition

RATIONALE

AMS2426F results from a Five-Year Review and update of this specification with changes to Stress Relief Treatment (see 3.1.2), Fixture Contact Locations (see 3.1.4), Procedure (see 3.2.3), Periodic Tests (see 4.2.2.1), control factors (see 4.4.3), and added Notice on use of cadmium in notes.

1. SCOPE

1.1 Purpose

This specification covers the requirements for vacuum deposited cadmium.

1.2 Application

This process has been used typically to provide a corrosion-resistant coating for high strength ferrous parts operating at not higher than 450 °F (232 °C) and requiring freedom from hydrogen embrittlement, but usage is not limited to such applications. Deposits are "line-of-sight" and may not be applicable to some internal surfaces.

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 that 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 issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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Documents

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2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2750	Pyrometry
AS2390	Chemical Process Test Specimen Material
AS7766	Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B117	Operating Salt Spray (Fog) Apparatus
ASTM B487	Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section
ASTM B499	Measurement of Coating Thicknesses by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals
ASTM B504	Measurement of Thickness of Metallic Coatings by the Coulometric Method
ASTM B568	Measurement of Coating Thickness by X-Ray Spectrometry
ASTM B571	Qualitative Adhesion of Metallic Coatings

2.3 Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Preparation

3.1.1 Ferrous parts heat treated to a range including or exceeding a tensile strength of 240 ksi (1655 MPa) or hardness of 49 HRC shall not be exposed to processes that cause hydrogen embrittlement, such as pickling, cathodic cleaning, and etching, or to corrosive environments.

3.1.2 Stress Relief Treatment

All steel parts having a hardness of 40 HRC and above and that are machined, ground, cold formed, or cold straightened after heat treatment shall be cleaned to remove surface contamination and thermally stress relieved before plating. (Residual tensile stresses have been found to be damaging during electroplating.) Furnaces used for stress relief shall be controlled per AMS2750; the minimum requirements shall be Class 5, and Type D instrumentation. Temperatures to which parts are heated shall be such that stress relief is obtained while still maintaining hardness of parts within specified limits. Unless otherwise specified, the following treatment temperatures and times shall be used:

- 3.1.2.1 For parts, excluding nitrided parts, having a hardness of 55 HRC and above, and for carburized and induction hardened parts, stress relieve at 275 °F ± 25 °F (135 °C ± 14 °C) for 5 to 10 hours.
- 3.1.2.2 For parts having a hardness less than 55 HRC, and for nitrided parts, stress relieve at 375 °F ± 25 °F (191 °C ± 14 °C) for a minimum of 4 hours. Higher temperatures shall be used only when specified or approved by the cognizant engineering organization.
- 3.1.2.3 For peened parts, if stress relief temperatures above 375 °F (191 °C) are specified, the stress relieve shall be performed prior to peening.

3.1.3 Parts shall be within specified dimensional tolerances after coating.

3.1.4 Fixture Contact Locations

3.1.4.1 For parts that are to be coated all over, and contact locations are not specified, contact locations shall be at the discretion of the processor.

3.1.4.2 For parts that are not to be coated all over, and contact locations are not specified, contact locations shall be in areas on which coating is not required.

3.2 Procedure

3.2.1 Cadmium shall be deposited directly onto the basis metal without a preliminary coating of other metal.

3.2.2 Parts shall be coated by deposition of vaporized metallic cadmium within a suitable vacuum.

3.2.2.1 The equipment and processes employed shall be adequate to ensure coverage of all external surfaces, including roots of threads, recesses, and sharp corners.

3.2.3 After coating, parts shall be conversion coated. Unless otherwise specified, a chromate conversion coating shall be used. When approved or specified by the cognizant engineering organization a non-hexavalent chromium conversion coating shall be used.

3.3 Properties

The cadmium coating shall conform to the following requirements:

3.3.1 Thickness

Thickness shall be as specified on the drawing, determined in accordance with any of the following methods as applicable: ASTM B487, ASTM B499, ASTM B504, ASTM B568, direct micrometer measurement, or other method acceptable to the cognizant engineering organization.

3.3.1.1 Coating thickness, when specified by AMS2426 and a suffix number, shall be as specified in Table 1 for the specified suffix number and type of part or surface.