



AEROSPACE MATERIAL SPECIFICATION

AMS2525™**REV. F**

Issued 1972-05
Reaffirmed 2007-11
Revised 2025-12

Superseding AMS2525E

Graphite Coating, Thin Lubricating Film,
Impingement Applied

RATIONALE

AMS2525F results from a Five-Year Review and update of this specification with changes to Ordering Information, Authority (see 1.4), Cleaning (see 3.2.1), Preservation (see 3.2.6), Thickness (see 3.3.2), Wear Life (see 3.3.3), Thermal Stability (see 3.3.4), and control factors (see 4.4.3).

NOTICE

ORDERING INFORMATION: The following information shall be provided to the plating processor by the purchaser.

1. Purchase order shall specify not less than the following:

- AMS2525F
- Part number of parts to be coated
- Quantity of pieces to be coated
- Basis metal and condition to be coated
- Coating thickness if other than in 3.3.2

2. Parts manufacturing operations such as heat treating, forming, joining, and media finishing can affect the condition of the substrate for coating or, if performed after coating, could adversely affect the performance of the coated part. The sequencing of these types of operations should be specified by the cognizant engineering organization or the purchaser and is not controlled by this specification.

1. SCOPE

1.1 Form

This specification covers a coating consisting of finely powdered graphite in a heat-resistant inorganic binder applied to parts.

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1.2 Application

This coating has been used typically on metal parts and selected nonmetallic materials requiring a coating under 0.0001 inch (2.5 µm) thick (see 8.3) for reducing friction or wear or for minimizing galling, but usage is not limited to such applications.

1.2.1 Aluminum, magnesium, and ferrous alloys, other than corrosion-resistant types, either coated or in contact with other parts having this coating, may be susceptible to corrosion.

1.2.2 This coating may not be suitable for use in vacuum or low humidity due to loss of lubricity under these conditions.

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.

1.4 Authority

The cognizant engineering organization (CEO) may impose requirements or approve allowances that supersede the requirements in this AMS.

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.

2.1 SAE Publications

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

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 D2510 Adhesion of Solid Film Lubricants

ASTM D2714 Calibration and Operation of the Falex Block-on-Ring Fixture Friction and Wear Testing Machine

ASTM D7091 Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Coating Material

Shall consist of finely powdered graphite in a heat-resistant inorganic binder. The coating, properly applied, shall form a lubricating film conforming to the requirements of 3.3.

3.2 Procedure

3.2.1 Cleaning

Before applying the coating, surfaces of the base material shall be thoroughly cleaned with minimum abrasion or erosion. The cleaned surfaces shall be visually free from oxides and from foreign materials detrimental to coating adhesion.

3.2.2 Masking

For parts with surfaces on which coating is not permitted, masking shall be applied and removed after coating by a method that will not change the properties of the base material or the applied coating. External shielding between the impingement nozzle and the part may be used instead of masking the part if its effectiveness can be demonstrated by inspection.

3.2.3 Surface Finishing

Surfaces of parts to be coated shall be honed with 120 to 400 mesh aluminum oxide powder to prepare the base material for coating.

3.2.3.1 To provide the proper surface for bearing applications, all residual metallic particles, whether mechanically or electrostatically held, shall be removed. The cleaning method may be the same or different from the one used in 3.2.1, depending on suitability.

3.2.4 Coating

The coating material shall be applied to all specified surfaces by spraying at high velocity (impinging) under controlled conditions.

3.2.5 Curing

Curing shall be performed at a temperature not exceeding 310 °F (154 °C).

3.2.6 Preservation

After curing, a supplementary preservative treatment shall be applied to metallic parts subject to corrosion. The preservative treatment shall be removable by vapor degreasing or other suitable process that does not affect the adhesion or performance of the coating.

3.3 Properties

The coating shall conform to the following requirements:

3.3.1 Adhesion

A pressure-sensitive film-backed tape, with an adhesion of not less than 45 ounce-inch (0.49 N/mm), shall be applied to a flat surface of a coated specimen, rolled in place, and then rapidly removed in accordance with ASTM D2510, Procedure B. The lifting of flakes or particles of the coating from the specimen exposing the base material is not acceptable. A uniform deposit of powdery material clinging to the tape is acceptable.

3.3.2 Thickness

Shall be not greater than 0.0001 inch (2.5 µm), determined in accordance with ASTM D7091, or by an alternate method acceptable to the CEO when ASTM D7091 is not practical (for example, when there is a nonmagnetic substrate).