



AEROSPACE MATERIAL SPECIFICATION

AMS2437™**REV. E**

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Superseding AMS2437D

Coating, Plasma Spray Deposition

RATIONALE

AMS2437E results from a Five-Year Review and update of this specification with changes to Ordering Information, powder specifications and coating properties (see Table 1), Procedure (see 3.5.4), Quality (see 3.7.2 and 3.7.3), Periodic Tests (see 4.2.2), and Note (see 8.5).

NOTICE

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

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

- AMS2437E
 - Quantity of pieces to be coated
 - Coating material (see 3.5.4)
 - Finished coating thickness desired (see 3.5.4)
 - Standards for acceptance of cup test or bend test and microexamination (see 3.6.1 and 3.6.4)
2. Parts manufacturing operations, such as heat treatment, forming, joining, and media finishing, can affect the condition of the substrate for coating or, if performed after coating, could adversely affect the coating. The sequencing of these types of operations should be specified by the cognizant engineering organization and is not controlled by this specification.
3. The parts manufacturer shall ensure that surfaces of metal parts supplied to the processor are free from blemishes, pits, tool marks, and other irregularities that will affect the quality of the finished parts (see 3.7.2).

1. SCOPE

1.1 Process

This specification covers the engineering requirements for applying coatings to parts by the plasma spray process and the properties of such coatings.

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Documents

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1.2 Application

This coating has been used typically to provide protection from wear, heat, corrosion (with sealer), and abrasion. The coating can also be used to restore dimensionally discrepant parts, but usage is not limited to such applications.

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 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS4027	Aluminum Alloy, Sheet and Plate, 1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061; -T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated
AMS4117	Aluminum Alloy, Rolled or Cold Finished, Bars, Rods, and Wire, and Flash Welded Rings, 1.0Mg - 0.60Si - 0.28Cu - 0.20Cr (6061; -T6, -T651)
AMS4911	Titanium Alloy, Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS4928	Titanium Alloy, Bars, Wire, Forgings, Rings, and Drawn Shapes, 6Al - 4V, Annealed
AMS5510	Steel, Corrosion- and Heat-Resistant, Sheet, Strip, and Plate, 18Cr - 10.5Ni - 0.40Ti (SAE 30321), Solution Heat Treated
AMS5645	Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings and Forging Stock, 18Cr - 10Ni - 0.40Ti (321), Solution Heat Treated
AMS5791	Cobalt Alloy, Powder, Plasma Spray, 56.5Co - 25.5Cr - 10.5Ni - 7.5W
AMS5792	Powder, Plasma Spray, 50 (88WC - 12Co) + 35 (70Ni - 16.5Cr - 4Fe - 4Si - 3.8B) + 15 (80Ni - 20Al), Three-Component Mixture
AMS5793	Powder, Plasma Spray, 95Ni - 5Al
AMS6350	Steel Sheet, Strip, and Plate, 0.95Cr - 0.20Mo (0.28 - 0.33C) (SAE 4130)
AMS6370	Steel, Bars, Forgings, and Rings, 0.95Cr - 0.20Mo (0.28 - 0.33C) (SAE 4130)
AMS7875	Powder, Chromium Carbide Plus Nickel-Chromium Alloy, 75Cr ₃ C ₂ + 25 (80Ni - 20Cr Alloy)
AMS7879	Tungsten Carbide-Cobalt Powder
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 C633 Adhesion or Cohesion Strength of Thermal Spray Coatings

ASTM E384 Microindentation Hardness of Materials

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Equipment

3.1.1 Torch

A specially constructed torch that dissociates and ionizes a suitable plasma-forming gas when an electric arc is struck between an anode and cathode. Coating particles, which are injected into the resultant high-velocity, high-temperature flame, are heated to plasticity and propelled toward the workpiece to be coated.

3.1.2 Gas

A suitable plasma-forming gas, as used in 3.1.1, may be any of the following, but the gas used shall be acceptable to the cognizant engineering organization (CEO):

- Nitrogen
- Mixtures of nitrogen and hydrogen
- Argon
- Mixtures of argon and hydrogen
- Mixtures of argon and helium

3.1.2.1 For substrates of titanium, titanium alloys, and steels heat treated above 180 ksi (1241 MPa) tensile strength, the plasma-forming gases shall be argon or a mixture of argon and helium.

3.1.3 Coating Material

Shall be a powder conforming to the specification required by the coating designation (see 3.5.1) specified. All powder shall be dry, free-flowing, and uniformly blended.

3.2 Personnel

Operators or other personnel performing manual plasma spray operations shall be trained to spray using each material and gas system designated. Competence of the manual spray operator or of fully mechanized equipment shall be demonstrated by spraying a set of test specimens as in 4.5.1, which shall meet the requirements of 3.6.