



AEROSPACE MATERIAL SPECIFICATION

AMS2447™**REV. E**

Issued 1998-05
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Revised 2026-07

Superseding AMS2447D

Coating, Thermal Spray,
High Velocity Oxygen/Fuel Process

RATIONALE

AMS2447E results from a Five-Year Review and update of this specification with changes to Ordering Information, Authority (see 1.5), Coating Material (see 3.2.2), Powder specification (see Table 1), Surface Conditioning (see 3.3.3), Preheating (see 3.4.1), Maximum part temperature (see Table 2), Temperature Measurement (see 3.4.3.1), Test Specimens (see 3.4.4), Coating properties (see Table 4), Microstructure (see 3.6.3.2), Bend Test (see 3.7.1), Bond Strength (see 3.7.2), Approval (see 4.4.2), Control factors (see 4.4.4), and Notes (see 8.3, 8.4, and 8.7).

NOTICE

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

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

- AMS2447E
- Basis metal to be coated
- Quantity of parts to be coated
- Coating composition (see 3.2.2.1)
- Classification Type (see 1.4)
- For Type 2 coatings, the Almen strip arc height requirements (see 3.6.4)
- Finished coating thickness (see 3.4.2)
- Geometric sample requirements, when specified (see 3.10)

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 coated part. The sequencing of these types of operations should be specified by the cognizant engineering organization and is not controlled by this specification.

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Full document details: SAE AMS2447E

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1. SCOPE

1.1 Purpose

This specification covers the requirements for thermal spray coatings applied using the high velocity oxygen fuel (HVOF) combustion process. This specification is not intended to be used for duplex coatings, i.e., the application of the coating over a previously applied coating.

1.2 Application

This process has been used typically to provide coatings of lower porosity and higher adhesive and/or cohesive strength than generally attainable with typical plasma spray processes for applications requiring wear, heat, and corrosion resistance and for dimensional restoration, 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 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 Classification

Type 1 - Coatings with no residual stress requirements

Type 2 - Coatings where the residual stress state is specified

1.4.1 If no Type is specified, Type 1 shall be provided.

1.5 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: 1-877-606-7323 (U.S. and Canada only) or 1-724-776-4970 (outside U.S. and Canada), 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, Flash-Welded 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

AMS5596	Nickel Alloy, Corrosion- and Heat-Resistant, Sheet, Strip, Foil and Plate, 52.5Ni - 19Cr - 3.0Mo - 5.1Cb (Nb) - 0.90Ti - 0.50Al - 18Fe, Consumable Electrode Remelted or Vacuum Induction Melted, 1775 °F (968 °C) 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
AMS5662	Nickel Alloy, Corrosion- and Heat-Resistant, Bars, Forgings, Rings, and Stock for Forgings and Rings, 52.5Ni - 19Cr - 3.0Mo - 5.1Cb (Nb) - 0.90Ti - 0.50Al - 18Fe, Consumable Electrode or Vacuum Induction Melted, 1775 °F (968 °C) Solution Heat Treated, Precipitation-Hardenable
AS7766	Terms Used in Aerospace Metals Specifications
SAE J442	Tools for Peening Intensity Determination and Verification

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 ASME Publications

Available from ASME, Two Park Avenue, New York, NY 10016-5990, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 646-616-3100 (outside North America), www.asme.org.

ASME B46.1 Surface Texture (Surface Roughness, Waviness, and Lay)

2.4 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Equipment

3.1.1 Torch

A specially constructed gun that uses combustion products to generate a high velocity gas stream for heating the coating material to a molten or plasticized state and transfers the coating material to the workpiece shall be used.

3.1.2 System

The system shall be fitted with controls for adjusting and monitoring the gas(es) and fuel(s) used to operate the torch.

3.1.2.1 Indicating devices used as system controls, as applicable to the process gases and fuels, shall have a minimum accuracy as follows: pressure gauges $\pm 1.5\%$ of full scale; flow meters $\pm 2\%$ of full scale.

3.1.3 Powder Feeder

The powder feed system shall supply a metered flow of material.