



AEROSPACE MATERIAL SPECIFICATION

AMS2425™**REV. G**

Issued 1966-03
Reaffirmed 2019-07
Revised 2025-09

Superseding AMS2425F

Plating, Gold,
for Thermal Control

RATIONALE

AMS2425G results from a Five-Year Review and update of this specification with changes to Ordering Information, Authority (see 1.2.1), Stress-Relief Treatment (see 3.1.1), Cleaning (see 3.1.2), Procedure (see 3.2), Surface Preparation (see 3.2.1), Copper Stride with Copper Underplate (see 3.2.2), Nickel Underplate (see 3.2.3), Gold Plate (see 3.2.4), Hydrogen Embrittlement Relief (see 3.2.6), Composition (see 3.3.1), Thickness (see 3.3.2), Copper Underplate (see 3.3.2.1), Nickel Underplate (see 3.3.2.2), Gold Plate (see 3.3.2.3), Thickness (see 3.3.2.4), Corrosion Resistance (see 3.3.4.1), Hydrogen Embrittlement (see 3.3.6), Quality (see 3.4), Acceptance Tests (see 4.2.1), Periodic Tests (see 4.2.2), Acceptance Tests (see 4.3.1), Periodic Tests (see 4.3.2), Specimen Configuration (see 4.3.3), Thickness Test (see 4.3.3.1), Adhesion Test (see 4.3.3.2), Corrosion-Resistance Test (see 4.3.3.3), Hydrogen Embrittlement Test (see 4.3.3.4), Control Factors (see 4.4.2.1), and Notes (see 8.4, 8.6, 8.7, 8.8, 8.9, and 8.10).

NOTICE

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

Purchase order shall specify not less than the following:

- AMS2425G
- Plating thickness desired (see 3.3.2) and minimum thickness on internal surfaces, if required (see 3.3.2.4)
- Basis metal to be plated
- Tensile strength or hardness of the basis metal
- Pre-plate stress relief to be performed by the plating processor (time and temperature), if different from 3.1.1
- Optional: Fixture/electrical contact locations, when not specified (see 3.1.3)
- Special features, geometry, or processing present on parts that requires special attention by the plating processor
- Hydrogen embrittlement relief to be performed by the plating processor (parameters or reference document), if different from 3.2.6

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SAE WEB ADDRESS:

Full document details: SAE AMS2425G

For more information on this standard, visit
<https://www.sae.org/standards/content/AMS2425G/>

Documents

Standard, visit Sharing Hub

- Periodic testing frequency and sample quantity, if different from 4.2.2 and 4.3.2
- Quantity of pieces to be plated

Parts manufacturing operations such as heat treating, forming, joining, and media finishing can affect the condition of the substrate for plating or, if performed after plating, could adversely affect the plated 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.

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 3.4.1).

1. SCOPE

1.1 Purpose

This specification covers the requirements for gold deposited on metal surfaces and the properties of the deposit.

1.2 Application

This process has been used typically for passive thermal control applications where high reflectance and low absorptance of solar radiation are required, but usage is not limited to such applications.

1.2.1 Authority

The cognizant engineering organization 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.

AMS2750	Pyrometry
AMS2759/9	Hydrogen Embrittlement Relief (Baking) of Steel Parts
ARP4992	Periodic Test for Processing Solutions
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) Testing Apparatus
ASTM B253	Preparation of Aluminum Alloys for Electroplating

ASTM B374	Standard Terminology Relating to Electroplating
ASTM B480	Preparation of Magnesium and Magnesium Alloys for Electroplating
ASTM B487	Measurement of Metal and Oxide Coating Thicknesses 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 B567	Measurement of Coating Thickness by the Beta Backscatter Method
ASTM B735	Porosity in Gold Coatings on Metal Substrates by Nitric Acid Vapor
ASTM B765	Guide for Selection of Porosity and Gross Defect Tests for Electrodeposits and Related Metallic Coatings
ASTM F519	Standard Test Method for Mechanical Hydrogen Embrittlement Evaluation of Plating/Coating Processes and Service Environments

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

2.4 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Preparation

3.1.1 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. The following treatment temperatures and times shall be used:

- 3.1.1.1 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.
- 3.1.1.2 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.
- 3.1.1.3 For peened parts: If stress-relief temperatures above 375 °F (191 °C) are specified, the stress relieve shall be performed prior to peening.

3.1.2 Cleaning

The plating shall be applied over a surface free from water breaks. The cleaning procedure shall not produce pitting or intergranular attack of the basis metal and shall preserve dimensional requirements.