



AEROSPACE MATERIAL SPECIFICATION

AMS2429™**REV. F**

Issued 1985-10
Reaffirmed 2006-09
Revised 2024-10

Superseding AMS2429E

Plating, Bronze
Nitriding Stop-off
90Cu - 10Sn

RATIONALE

AMS2429F results from a Five-Year Review and update of this specification with changes to Ordering Information, Definitions (see 2.3.1), Fixture/Electrical Contact Locations (see 3.1.4), Hydrogen Embrittlement Relief (see 3.3), Quality (see 3.5.3 and 3.5.4), Sample Configuration (see 4.3.3.2), and Notes (see 8.8 and 8.9).

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:

- AMS2429F
- Basis metal to be plated
- Tensile strength or hardness of the basis metal (steel alloys only)
- Plating thickness desired, if different from (see 3.4.1.1)
- If steel parts 40 HRC and above have been machined, ground, cold formed, or cold straightened after heat treatment (see 3.1.1.)
- If pre-plate stress relief is to be performed by the plating processor and, if different from 3.1.1, time and temperature to be specified
- Special features, geometry, or processing present on parts that requires special attention by the plating processor
- Optional: fixture/electrical contact locations, when not specified (see 3.1.4)
- If an alternative of the ferricyanide test method is to be used (see 4.3.4.1)
- Hydrogen embrittlement relief to be performed (time and temperature), if different from 3.3

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Documents

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- Optional: periodic testing frequency (see 4.2.2) and sample quantity (see 4.3.2)
 - Quantity of pieces to be plated or to be stripped (post-nitriding)
 - Special processing, when required, to avoid or remove discoloration, post-plate (see 3.5.1) or post-strip (see 3.5.2)
2. 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.
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 3.5).

1. SCOPE

1.1 Purpose

This specification covers the requirements for electrodeposited bronze plate and its subsequent removal.

1.2 Application

This process has been used typically as a maskant to prevent nitriding of surfaces on which nitriding is neither required nor permitted, 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.

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.

AMS2451	Plating, Brush, General Requirements
AMS2750	Pyrometry
AMS 2759/9	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 B374	Terminology Relating to Electroplating
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 B567	Measurement of Coating Thicknesses by the Beta Backscatter Method
ASTM B568	Measurement of Coating Thickness by X-Ray Spectrometry
ASTM B571	Qualitative Adhesion Testing of Metallic Coatings
ASTM E376	Measuring Coating Thickness by Magnetic-Field or Eddy Current (Electromagnetic) Testing Methods
ASTM E478	Chemical Analysis of Copper Alloys
ASTM F519	Mechanical Hydrogen Embrittlement Evaluation of Plating/Coating Processes and Service Environments

2.3 Definitions

Terms used in AMS are defined in AS7766.

ASTM B374 should be utilized as a reference and referee document when areas of design definition or technical interpretation arise.

2.3.1 NITRIDING

Nitriding is a heat-treating process that diffuses nitrogen into the surface of a metal to create a case-hardened surface. These processes are most commonly used on low-alloy steels.

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. Parts having a hardness less than 55 HRC shall be stress relieved at 375 °F ± 25 °F (191 °C ± 14 °C) for a minimum of 4 hours. Nitrided parts fall into this category. Higher temperatures shall only be used when specified or approved by the cognizant engineering organization.

3.1.2 Substrate

Surfaces of metal parts to be plated shall be smooth and substantially free from blemishes, pits, tool marks, and other irregularities.