



# AEROSPACE MATERIAL SPECIFICATION

**AMS2433™****REV. E**

Issued 1986-01  
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Revised 2026-04

Superseding AMS2433D

Plating, Nickel-Thallium-Boron or Nickel-Boron,  
Electroless Deposition

## RATIONALE

AMS2433E results from a Five-Year Review and update of this specification with changes to Ordering Information, Authority (see 1.5), Corrosion Pit (see 2.3.1), Fixture Contact Locations (see 3.1.4), Corrosion Resistance (see 3.4.6), Quality (see 3.5), and Notes (see 8.2 and 8.8).

## 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:

- AMS2433E
- Type of deposit desired (see 1.3)
- Plate thickness desired (see 3.4.3)
- Solid film lubricant or polymer, if desired (see 3.3.2)
- Basis metal to be plated
- Tensile strength or hardness of the basis metal (steel alloys only)
- If steel parts were machined, ground, cold formed, or cold straightened after heat treat (see 3.1.2)
- If steel parts have been shot peened, specify if required stress relief has been completed (see 3.1.2.3)
- If pre-plate stress relief is to be performed by the plating processor and (time and/or temperature) if different from 3.1.2
- Optional: fixture contact locations, when not specified (see 3.1.4)
- Special features, geometry, or processing present on parts that require special attention by the plating processor

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**TO PLACE A DOCUMENT ORDER:** Tel: 1-877-606-7323 (U.S. and Canada only)  
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Fax: 724-776-0790  
Email: CustomerService@sae.org  
http://www.sae.org

SAE WEB ADDRESS:

Full document details: SAE AMS2433E

For more information on this standard, visit  
<https://www.sae.org/standards/content/AMS2433E/>

Documents

Standard, visit Sharing Hub

- Hydrogen-embrittlement relief to be performed by the plating processor (parameters or reference document) if different from 3.3.1
  - Post-treatment bake (see 3.3.1.1), time, and/or temperature, if different from 3.3.1
  - Hardness requirements, as plated, and/or post-treatment bake, if different from 3.4.2
  - Optional: wear test frequency and wear scar width acceptance criteria (see 3.4.5)
  - Periodic testing frequency (see 4.2.2) and/or sample quantity (see 4.3.3), if different than that stated
  - Special processing, when required, to avoid or remove discoloration (see 3.5)
  - Quantity of pieces to be plated
2. Parts manufacturing operations, such as heat treatment, forming, joining, and media finishing, can affect the condition of the substrate for plating or, if performed after plating, could adversely affect the plate. 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 3.5.1).

## 1. SCOPE

### 1.1 Purpose

This specification covers the requirements for an electroless nickel-thallium-boron or nickel-boron deposit on various substrates.

### 1.2 Application

This process has been used typically to provide a hard, ductile, wear-resistant surface for operation in service up to 1000 °F (538 °C), to provide uniform buildup on complex shapes, and to enhance solderability of surfaces, but usage is not limited to such applications. This process is not generally recommended for materials subject to over-tempering or high-temperature embrittlement when exposed to the post-plating heat treatment of 675 °F (357 °C) for 90 minutes (see 3.3.1 and 3.3.1.1).

### 1.3 Classification

The deposits covered by this specification are classified by composition as follows:

Type 1 - Nickel-Thallium-Boron

Type 2 - Nickel-Boron

Unless otherwise specified, Type 1 shall be supplied.

### 1.4 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.

### 1.5 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: 877-606-7323 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), [www.sae.org](http://www.sae.org).

|         |                                               |
|---------|-----------------------------------------------|
| AMS2404 | Plating, Electroless Nickel-Phosphorous       |
| AMS2451 | Plating, Brush, General Requirements          |
| AMS2750 | Pyrometry                                     |
| AMS4751 | Tin - Lead Eutectic, 63Sn - 37Pb              |
| ARP4992 | Periodic Test Plan 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](http://www.astm.org).

|            |                                                                                                                   |
|------------|-------------------------------------------------------------------------------------------------------------------|
| ASTM B32   | Solder Metal                                                                                                      |
| ASTM B117  | Operating Salt Spray (Fog) Apparatus                                                                              |
| ASTM B253  | Preparation of Aluminum Alloys for Electroplating                                                                 |
| 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 B567  | Measurement of Coating Thickness by the Beta Backscatter Method                                                   |
| ASTM B568  | Measurement of Coating Thickness by X-Ray Spectrometry                                                            |
| ASTM B571  | Qualitative Adhesion Testing of Metallic Coatings                                                                 |
| ASTM B748  | Measurement of Thickness of Metallic Coatings by Measurement of Cross Section with a Scanning Electron Microscope |
| ASTM D2714 | Calibration and Operation of the Falex Block-on-Ring Friction and Wear Testing Machine                            |
| ASTM E376  | Measuring Coating Thickness by Magnetic-Field or Eddy Current (Electromagnetic) Testing Methods                   |