



Designation: B480 – 88 (Reapproved 2022)

Standard Guide for Preparation of Magnesium and Magnesium Alloys for Electroplating¹

This standard is issued under the fixed designation B480; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide describes two processes used for plating on magnesium and magnesium alloys: direct electroless nickel plating and zinc immersion. Some users report that the direct electroless nickel procedure does not produce quite as high a level of adhesion as zinc immersion.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see 5.1.1 and 5.2.9.2.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

B322 Guide for Cleaning Metals Prior to Electroplating

3. Significance and Use

3.1 Metals are electroplated on magnesium for various purposes: solderability, RF grounding, hermetic sealing, wear resistance, corrosion resistance, appearance, and electrical conductivity, for example. Because magnesium is covered with

a naturally occurring oxide film, usual procedures for the preparation of metals for autocatalytic or electrolytic plating cannot be used.

4. Reagents

4.1 *Purity of Reagents*—All acids and chemicals used in this guide are of technical grade. Acid and base solutions are based on the following assay materials:

Ammonium hydroxide (NH_4OH)	30 mass %, density 0.895 g/L
Nitric acid (HNO_3)	67 mass %, density 1.16 g/L
Sulfuric acid (H_2SO_4)	93 mass %, density 1.40 g/L
Hydrofluoric acid (HF)	70 mass %, density 1.258 g/L
Phosphoric acid (H_3PO_4)	85 mass %, density 1.689 g/L

4.2 *Purity of Water*—All water used for solutions, whether new or recycled, should be monitored for cations, anions, and organic matter that are known to interfere with the plating process.

5. Processes

5.1 Procedures:

5.1.1 Wheel polish and buff parts for smooth, highly polished surfaces. Tumble and burnish small parts. Acid pickle the parts after use of wire brushing or steel wool. (**Warning**—Because of the high flammability of powdered magnesium, special precautions against fire are important. Polishing and buffing lathes should be kept scrupulously clean. Dust from grinding in and around lathes should be swept up and placed in closed containers for proper disposal. Exhaust systems should be cleaned frequently and the residues handled similarly. If abrasives are used in tumble finishing, similar precautionary techniques should be used for the solids from the abrasive slurry.)

5.1.2 *Chemical*—Remove oil and grease in an alkaline soak cleaner. Remove other soils and coatings in suitable acid pickling solutions.

NOTE 1—General information on the cleaning of metals is given in Practice **B322**.

5.2 General Electroplating Procedure:

5.2.1 Remove oil, grease, and other soils left from preplating procedures by soak cleaning in an alkaline cleaner suitable for magnesium.

5.2.2 Rinse in cold water.

¹ This guide is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.02 on Pre Treatment.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.