



Standard Specification for Electrodeposited Coatings of Palladium-Nickel for Engineering Use¹

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1. Scope

1.1 *Composition*—This specification covers requirements for electrodeposited palladium-nickel coatings containing between 70 and 95 mass % of palladium metal. Composite coatings consisting of palladium-nickel and a thin gold overplate for applications involving electrical contacts are also covered.

1.2 *Properties*—Palladium is the lightest and least noble of the platinum group metals. Palladium-nickel is a solid solution alloy of palladium and nickel. Electroplated palladium-nickel alloys have a density between 10 and 11.5, which is substantially less than electroplated gold (17.0 to 19.3) and comparable to electroplated pure palladium (10.5 to 11.8). This yields a greater volume or thickness of coating per unit mass and, consequently, some saving of metal weight. The hardness range of electrodeposited palladium-nickel compares favorably with electroplated noble metals and their alloys (**1, 2**).²

NOTE 1—Electroplated deposits generally have a lower density than their wrought metal counterparts.

	Approximate Hardness (HK ₂₅)
Gold	50–250
Palladium	75–600
Platinum	150–550
Palladium-Nickel	300–650
Rhodium	750–1100
Ruthenium	600–1300

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

¹ This specification is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is under the direct responsibility of Subcommittee B08.03 on Engineering Coatings.

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² The boldface numbers in parentheses refer to the list of references at the end of this specification.

2. Referenced Documents

2.1 ASTM Standards:³

- B183 Practice for Preparation of Low-Carbon Steel for Electroplating
- B242 Guide for Preparation of High-Carbon Steel for Electroplating
- B254 Practice for Preparation of and Electroplating on Stainless Steel
- B281 Practice for Preparation of Copper and Copper-Base Alloys for Electroplating and Conversion Coatings
- B322 Guide for Cleaning Metals Prior to Electroplating
- B343 Practice for Preparation of Nickel for Electroplating with Nickel
- B374 Terminology Relating to Electroplating
- B481 Practice for Preparation of Titanium and Titanium Alloys for Electroplating
- B482 Practice for Preparation of Tungsten and Tungsten Alloys for Electroplating
- B487 Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section
- B488 Specification for Electrodeposited Coatings of Gold for Engineering Uses
- B489 Practice for Bend Test for Ductility of Electrodeposited and Autocatalytically Deposited Metal Coatings on Metals
- B507 Practice for Design of Articles to Be Electroplated on Racks
- B542 Terminology Relating to Electrical Contacts and Their Use
- B558 Practice for Preparation of Nickel Alloys for Electroplating
- B568 Test Method for Measurement of Coating Thickness by X-Ray Spectrometry
- B571 Practice for Qualitative Adhesion Testing of Metallic Coatings
- B602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings

³ 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.