



Standard Specification for Palladium-Silver-Copper Electrical Contact Alloy¹

This standard is issued under the fixed designation B 563; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers an alloy containing palladium, silver, copper, platinum, and nickel in the form of wire, rod, and strip for electrical contacts.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.3 The following precautionary statement pertains to the test method portion only, Section 7, of this specification: *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.*

2. Referenced Documents

2.1 ASTM Standards:

B 476 Specification for General Requirements for Wrought Precious Metal Electrical Contact Materials²

E 8 Test Methods of Tension Testing of Metallic Materials³

E 384 Test Method for Microhardness of Materials³

3. Materials and Manufacture

3.1 Raw materials shall be of such quality and purity that the finished product will have the properties and characteristics prescribed in this specification.

3.2 The material shall be finished by such operations (cold working, heat treating, annealing, turning, grinding, pickling) and are required to produce the prescribed properties.

4. Chemical Composition

4.1 Material produced under this specification shall meet the requirements of chemical composition shown in Table 1.

¹ This test method is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.05 on Precious Metals.

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² Annual Book of ASTM Standards, Vol 03.04.

³ Annual Book of ASTM Standards, Vol 03.01.

TABLE 1 Chemical Requirements

Element	Composition, weight %
Palladium	43.0–45.0
Silver	37.0–39.0
Copper	15.5–16.5
Platinum	0.8–1.2
Nickel	0.8–1.2
Total noble metal impurities	0.2 max
Total base metal impurities	0.2 max

5. Mechanical Properties

5.1 The contract or order may specify ultimate tensile strength, elongation, microhardness (Knoop or Vickers), hardness (Rockwell or Rockwell Superficial), or a combination of these mechanical properties as temper criterion. If the contract or order does not specify a temper criterion, then the criterion for temper designation will be ultimate tensile strength and elongation.

5.2 The material shall conform to the mechanical properties shown in Table 2, Table 3, or Table 4.

6. General Requirements

6.1 Specification B 476 shall apply to all materials produced to this specification.

7. Test Methods

7.1 Test methods are in accordance with Specification B 476.

TABLE 2 Mechanical Requirements for Wire 0.003 to 0.020 in. (0.13 to 0.51 mm) Diameter^A

Property	Units	Temper		Age Hardened
		Solution Annealed	Stress Relieved	
Tensile strength	ksi	100–120	135–165	160–210
	MPa	689–827	930–1137	1034–1344
Elongation	percent	20 min	8 min	1–10
Hardness, Knoop	HK ₁₀₀ ^B	170–250	260–330	320–380
Hardness, Vickers	HV ₁₀₀ ^B	170–240	240–330	290–370

^ASee 7.1.

^BSee 7.3.