



Standard Specification for Palladium-Silver-Copper Electrical Contact Alloy ¹

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. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by 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 Materials ²

E 8 Test Methods of Tension Testing of Metallic Materials ³

E 384 Test Method for Microhardness of Materials ³

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.

5. Mechanical Properties

5.1 The criterion for temper designation shall be Knoop

¹ This specification is under the jurisdiction of ASTM Committee B-4 on Metallic Materials for Thermostats and for Electrical Resistance, Heating, and Contacts and is the direct responsibility of Subcommittee B04.02 on Electrical Contact Materials.

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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

hardness, Vickers hardness, or tensile properties (ultimate tensile strength and elongation), or a combination of hardness and tensile strength as specified in the contract or order.

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.

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.

TABLE 3 Mechanical Requirements for Wire Over 0.020 to 0.060 in. (0.51 to 1.52 mm) Diameter ^A

Property	Units	Temper	
		Solution Annealed	Age Hardened
Tensile strength	ksi	100–120	160–210
	MPa	689–827	1000–1310
Elongation	percent	15 min	1–10
Hardness, Knoop	HK ₁₀₀ ^B	170–250	340–400
Hardness, Vickers	HV ₁₀₀ ^B	170–240	310–390

^ASee 7.1.

^BSee 7.3.