Designation: B 541 – 01

Standard Specification for Gold Electrical Contact Alloy[1]

This standard is issued under the fixed designation B 541; 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 a gold-rich, age-hardenable alloy in rod, wire, and strip form applicable to electrical contacts.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units may be approximate.

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, annealing, turning, grinding, age hardening, etc.) as are required to produce the prescribed properties.

4. Chemical Composition

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

5. Condition

5.1 This specification covers the conditions and forms listed in Table 2.

TABLE 1 Chemical Requirements

Element	Composition, Weight %	
	Nominal	Range
Gold	71.5	70.5–72.5
Platinum	8.5	8.0–9.0
Silver	4.5	4.0–5.0
Copper	14.5	13.5–15.5
Zinc	1.0	0.7–1.3
Total base metal impurities	...	0.2 max
Total platinum group metal impurities	...	0.2 max

TABLE 2 Conditions and Forms

Process	Symbol	Form		
		Wire	Strip	Rod
Annealed	A	X	X	X
Stress relieved	S-R	X	X	
Age hardened from solution annealed condition	HT-A	X	X	X
Age hardened from solution annealed and cold-worked condition	HT-CW	X	X	X

6. Mechanical Properties

6.1 Mechanical properties shall conform to Table 3 and Table 4 as appropriate.

6.2 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.

6.3 Mechanical properties of flattened wire, less than 0.012 in. (0.30 mm) thick shall conform to 6.1 (Table 5).

7. Test Methods

7.1 Test methods are in accordance with Specification B 476.

7.2 All tension tests are in accordance with Methods E 8 and tensile specimens are full cross-section size when practical.

7.3 Hardness is in accordance with Test Method E 384. Test material 0.005 in. (0.13 mm) in thickness (diameter) and larger using a 100-gf indenter load. Test material less than 0.005 in.

[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 and Electrical Contact Materials.

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[2] *Annual Book of ASTM Standards*, Vol 02.04.

[3] *Annual Book of ASTM Standards*, Vol 03.01.