



Designation: B684 – 97 (Reapproved2012)

Standard Specification for Platinum-Iridium Electrical Contact Materials¹

This standard is issued under the fixed designation B684; 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 85 % platinum—15 % iridium alloy, and a 90 % platinum—10 % iridium alloy, in the form of rod, wire, strip, and sheet material for electrical contacts.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 The original specification, B684 - 81, covered the 85 % platinum 15 % iridium alloy. The 1997 revision of this specification added the 90 % platinum 10 % iridium alloy.

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 become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

B277 Test Method for Hardness of Electrical Contact Materials

B476 Specification for General Requirements for Wrought Precious Metal Electrical Contact Materials

E8 Test Methods for Tension Testing of Metallic Materials

E384 Test Method for Knoop and Vickers Hardness of Materials

¹ This specification 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.

Current edition approved Nov. 1, 2012. Published November 2012. Originally approved in 1981. Last previous edition approved in 2008 as B684 – 97 (2008). DOI: 10.1520/B0684-97R12.

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.

3. 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, or pickling) as are required to produce the prescribed properties.

4. General Requirements

4.1 The provisions of Specification B476 shall apply to all materials produced to this specification.

5. Chemical Requirements

5.1 Material produced under the specification shall meet the requirements of chemical composition prescribed in Table 1.

5.2 By agreement between purchaser and manufacturer, analysis may be required and limits established for elements or compounds not specified in the table of chemical composition.

NOTE 1—Analysis is regularly made for the elements for which specific limits are listed. If, however, the presence of “other” elements is suspected or indicated in the course of routine analysis, further analysis shall be made to determine that the total of these “other” elements and the listed impurities is not in excess of the total impurities limit.

6. Mechanical Requirements

6.1 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.

6.2 The mechanical properties shall conform to those properties listed in Table 2 and Table 3. The term “work hardened,” as used in these tables, refers to material which has been subjected to a minimum of 30 % reduction in cross-sectional area.

6.3 All test specimens shall be full size when practical.

6.4 All tests are to be conducted at room temperature, 65 to 85°F (18 to 29°C).