



Designation: B 702 – 93 (Reapproved 1998)

## Standard Specification for Copper-Tungsten Electrical Contact Material <sup>1</sup>

This standard is issued under the fixed designation B 702; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This specification covers electrical contact components made from copper tungsten by powder metallurgical procedures.

1.2 This specification covers compositions within the copper tungsten system normally specified by users of contacts.

1.3 *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.*

1.4 It is the responsibility of the user to become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet for this product/material as provided by the manufacturer.

### 2. Referenced Documents

2.1 *ASTM Standards:*

B 328 Test Method for Density, Oil Content, and Interconnected Porosity of Sintered Metal Structural Parts and Oil-Impregnated Bearings<sup>2</sup>

### 3. Significance and Use

3.1 Proprietary methods for manufacture of these materials vary significantly among suppliers and these methods influence such properties as arc erosion, contact resistance, and tendency to weld in service. Since the performance of contacts in a device depends on numerous factors outside the contact itself (opening speed, closing speed, contact pressure, contact bounce, environmental variations, assembly technique and variations, etc.) this specification cannot ensure performance control in the application. As part of the qualification on initial samples it is recommended that the user functionally electrically test the materials for all devices applicable to the material's use. This specification will provide a means for the contact manufacturer and contact user to reach agreement on the details of material to be supplied for a specified use and

reasonable assurance that future lots will be similar in properties and microstructure to the initial test or sample contacts supplied.

### 4. Ordering Information

4.1 Orders for this material under this specification shall include the following information:

4.1.1 Dimensions (see Section 8),

4.1.2 Chemical composition (see reference tables in Related Material as possible guideline),

4.1.3 Physical properties (see Section 6 and reference tables as guideline),

4.1.4 Certification (see Section 11), and

4.1.5 Other features as agreed upon between the vendor and the user.

### 5. Chemical Requirements

5.1 The material shall conform to composition limits as agreed upon between the manufacturer and the user.

5.2 The chemical analysis shall be made in accordance with the methods prescribed in the newest edition of *Annual Book of ASTM Standards*, or by any other approved method agreed upon between the manufacturer and the purchaser.

### 6. Other Properties

6.1 The manufacturer and the purchaser shall agree on qualification tests for determination of physical properties.

6.2 The tests shall be performed on production parts, wherever practical or applicable. (Small size contacts do not lend themselves to accurate conductivity measurement.)

6.3 The tests shall be determined after consideration of the function of the part.

6.4 The typical properties of five most common types of copper-tungsten contacts are given in Appendix X1.

### 7. Dimensions and Permissible Variations

7.1 Permissible variations in dimensions shall be within the limits specified on drawings describing the contacts and accompanying the order, or shall be within the limits specified in the purchase order.

### 8. Workmanship, Finish, and Appearance

8.1 The parts shall be free of defects in material or processing, which would seriously affect their performance.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee B-2 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B2.05 on Precious Metals.

Current edition approved Aug. 15, 1993. Published October 1993. Originally published as B 702 – 82. Last previous edition B 702 – 88.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 02.05.