Designation: B 664 – 90 (Reapproved 2000)

Standard Specification for 80 % Silver-20 % Graphite Sliding Contact Material[1]

This standard is issued under the fixed designation B 664; 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.

1. Scope

1.1 This specification defines the criteria for composition and other requirements for brushes with a nominal silver content of 80 %, by weight, with the balance being substantially graphite.

1.2 *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.*

1.3 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 613 Guide for Preparing Specifications for Miniature Brushes of Composite Materials for Sliding Electric Contacts[2]

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials[3]

2.2 *ANSI Standard:*

C64.1 Brushes for Electrical Machines[4]

3. Requirements

3.1 *Chemical Composition*, shall be as follows:

Silver	80 ± 3 % (weight)
Graphite	balance
Total metal impurities	1 % max
Percent ash in graphite (ANSI C64.1)	5 % max

3.2 *Physical Properties*—The following lot average properties must be met. Unless otherwise agreed between the producer and the user, the number of samples shall be five.

3.2.1 *Density*—The minimum acceptable density shall be 5.15 g/cm ^{3}as determined by the measurement and weight method defined by ANSI C64.1.

3.2.2 *Shear Strength*:

3.2.2.1 The shear strength for the normal and transverse directions shall be measured for rectangular parallelepipeds and shall be 2000 psi (14 MPa), minimum.

3.2.2.2 The shear strength for the longitudinal shear direction shall be measured for cylinders and shall be 1000 psi (6.9 MPa), minimum.

3.3 *Microstructure*—Parts shall be visually free of structural defects, cracks, etc., upon examination at 50×. The press direction, as evidenced by laminations, shall be as defined by the purchase order. Also the brush material shall not contain abrasive particles that will sliver a metal alloy ring with a hardness ≥110 $HK_{10\,0}$ when the brush force is equal to 30 g or that necessary for 5.0 psi (34 kPa) pressure, whichever is greater. A sliver is defined as a loose wear particle with one dimension ≥50× the next smaller dimension. Although slivering can be caused by coarse abrasive particles, other parameters can contribute to slivering (for example, very high brush force).

3.4 Source or grade of raw materials (for example, graphite) or methods of manufacture shall not be changed without notifying users.

4. Reference Properties

4.1 Because of their size, the following properties for miniature brushes cannot always be determined; however, these properties are typical for larger parts.

4.1.1 *Superficial Hardness*—The typical Rockwell superficial hardness for this material is 44 R15W as determined by Test Method E 18 with a ⅛-in. steel ball.

4.1.2 *Specific Resistance*—The typical specific resistance for the material is $4 \times 10^{-6}\Omega$-in. ($1 \times 10^{-7}\Omega$-m) as determined by the method detailed in ANSI C64.1.

5. Certification

5.1 Material supplied under this specification shall be certified as meeting the requirements of this specification by the producer of the material.

[1] This test method is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B2.05 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.

[4] Available from the American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, N. Y. 10036.