



# Standard Specification for Copper-Cobalt-Beryllium (UNS No. C17500) and Copper- Nickel-Beryllium (UNS No. C17510) Rod and Bar<sup>1</sup>

This standard is issued under the fixed designation B 441; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope \*

1.1 This specification covers the requirements for copper-cobalt-beryllium alloy (UNS C17500), and copper-nickel-beryllium alloy (UNS C17510) rod and bar in straight lengths.

1.2 The intent is to provide a system of interchangeable alloys.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

## 2. Referenced Documents

### 2.1 ASTM Standards:

B 193 Test Method for Resistivity of Electrical Conductor Material<sup>2</sup>

B 194 Specification for Copper-Beryllium Alloy Plate, Sheet, Strip and Rolled Bar<sup>3</sup>

B 249 Specification for General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, Shapes and Forgings<sup>3</sup>

B 601 Practice for Temper Designations for Copper and Copper Alloys—Wrought and Cast<sup>3</sup>

B 846 Terminology for Copper and Copper Alloys<sup>3</sup>

E 8 Test Methods for Tension Testing of Metallic Materials<sup>4</sup>

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials<sup>4</sup>

E 1004 Test Method for Electromagnetic (Eddy-Current) Measurements of Electrical Conductivity<sup>5</sup>

## 3. Terminology

3.1 For definition of terms related to copper and copper alloys, refer to Terminology B 846.

## 4. Ordering Information

4.1 Orders for product under this specification should include the following information:

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee B-5 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.02 on Rod, Bar, Wire, Shapes, and Forgings.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 02.03.

<sup>3</sup> Annual Book of ASTM Standards, Vol 02.01.

<sup>4</sup> Annual Book of ASTM Standards, Vol 03.01.

<sup>5</sup> Annual Book of ASTM Standards, Vol 03.03.

- 4.1.1 ASTM designation and year of issue,
- 4.1.2 Copper alloy designation,
- 4.1.3 Temper (Section 6 and Table 1 and Table 2),
- 4.1.4 Form of product (cross section such as round, hexagonal, octagonal, rectangular, or square),
- 4.1.5 Dimensions (diameter or distance between parallel surfaces),
- 4.1.6 Edge contours,
- 4.1.7 Length,
- 4.1.8 Quantity; total weight, footage or number of pieces for each form, temper, size, and copper alloy, and
- 4.1.9 When product is purchased for agencies of the U.S. Government (Section 10).
- 4.2 The following are options available under this specification and should be included in the contract or purchase order when required:
  - 4.2.1 Heat identification or traceability details (Specification B 249),
  - 4.2.2 Tensile strength test (9.2.2),
  - 4.2.3 Certification (Specification B 249), and
  - 4.2.4 Mill test report (Specification B 249).

## 5. Chemical Composition

5.1 The material shall conform to the compositional limits given in Table 3 for the copper alloy designated in the ordering information.

5.1.1 These composition limits do not preclude the presence of other elements. Limits may be established and analysis required for unnamed elements by agreement between the manufacturer and the purchaser.

5.2 Copper, listed as the “Remainder” is the difference between the sum of results for all elements determined and 100 %.

5.3 When all elements specified in Table 3 for the copper alloy designated in the ordering information are determined, the sum of results shall be 99.5 % min.

## 6. Temper

6.1 Tempers, as described in Practice B 601, available under the specification are: TB00 (solution heat treated (A)), TF00 (precipitation hardened (AT)), TD04 (solution heat treated and cold worked: hard (H)), and TH04 (hard and precipitation heat treated (HT)).