



Designation: B 150M – 95a
METRIC

Standard Specification for Aluminum Bronze, Rod, Bar, and Shapes [Metric]¹

This standard is issued under the fixed designation B 150M; 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 the aluminum bronze rod, bar and shapes for copper alloys UNS Nos. C60600, C61300, C61400, C61900, C62300, C62400, C63000, C63020, C63200, C64200 and C64210.²

NOTE 1—Material for hot forging is described in Specification B 124M.

NOTE 2—This specification is the metric companion to Specification B 150.

NOTE 3—**Warning:** Mercury is a definite health hazard in use and disposal (see 8.1).

2. Referenced Documents

2.1 The following documents of the issue in effect on the date of material purchase form a part of this specification to the referenced herein:

2.2 ASTM Standards:

B 124M Specification for Copper and Copper Alloy Forging Rod, Bar and Shapes (Metric)³

B 154 Test Method for Mercurous Nitrate Test for Copper and Copper Alloys³

B 249M Specification for General Requirements for Wrought Copper and Copper Alloy Rod, Bar and Shapes (Metric)³

B 601 Practice for Temper Designations for Copper and Copper Alloys—Wrought and Cast³

E 53 Test Methods for Chemical Analysis of Copper⁴

E 54 Test Methods for Chemical Analysis of Special Brasses and Bronzes⁴

E 62 Test Methods for Chemical Analysis of Copper and Copper Alloys (Photometric Methods)⁴

E 118 Test Methods for Chemical Analysis of Copper-Chromium Alloys⁴

E 478 Test Methods for Chemical Analysis of Copper-Alloys⁴

E 527 Practice for Numbering Metals and Alloys (UNS)⁵

3. Ordering Information

3.1 ASTM designation and year of issue.

3.2 Alloy No.

3.3 Temper.

3.4 Quantity, total weight, footage or number of pieces of each size.

3.5 Form of material (cross section such as round, rectangular or hexagonal).

3.6 Dimensions (diameter or distance between parallel surfaces).

3.7 Length.

3.8 When Alloy C63020 is specified, the tolerance for diameter, thickness, width and length shall be part of the purchase order and shall be agreed upon between the supplier and the purchaser.

3.9 Piston finish, when required.

3.10 State if the material is to be used for welding applications.

3.11 *Shapes*—The dimensional tolerances shall be as agreed upon between the manufacturer and the purchaser and shall be specified.

3.12 Certification, when required.

3.13 Mill test reports, when required.

4. Materials and Manufacture

4.1 Refer to Specification B 249M.

5. Chemical Composition

5.1 The material shall conform, by alloy, to the compositional requirements specified in Table 1.

5.1.1 Copper, when specified as the remainder and not determined directly, shall be taken as the difference between the sum of all elements with limiting values analyzed and 100 %.

5.2 The sum of specified elements, when analyzed, shall be 99.5 % minimum for all alloys except C61300 which shall be 99.8 % minimum.

5.3 These specification limits do not preclude the presence of other elements. Limits for unnamed elements may be

¹ This specification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.02 on Rod, Bar, Shapes, and Forgings.

Current edition approved on June 15, 1995. Published August 1995. Originally published as B 150M – 84. Last previous edition B 150M – 95.

² Refer to Practice E 527 for a description of the Unified Numbering System (UNS).

³ *Annual Book of ASTM Standards*, Vol 02.01.

⁴ *Annual Book of ASTM Standards*, Vol 03.05.

⁵ *Annual Book of ASTM Standards*, Vol 01.01.

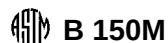


TABLE 1 Chemical Requirements

Elements	Composition, %										
	Copper Alloy UNS No.										
	C60600	C61300	C61400	C61900	C62300	C62400	C63000	C63020	C63200	C64200	C64210
Aluminum	4.0–7.0	6.0–7.5	6.0–8.0	8.5–10.0	8.5–11.0	10.0–11.5	9.0–11.0	10.00–11.0	8.7–9.5	6.3–7.6	6.3–7.0
Copper (incl silver)	remainder	remainder	remainder	remainder	remainder	remainder	remainder	74.5 min	remainder	remainder	remainder
Iron	0.50, max	2.0–3.0	1.5–3.5	3.0–4.5	2.0–4.0	2.0–4.5	2.0–4.0	4.0–5.5	3.5–4.3 ^A	0.30 max	0.30 max
Nickel (incl cobalt)	...	0.15 max	...	...	1.0 max	...	4.0–5.5	4.2–6.0	4.0–4.8	0.25 max	0.25 max
Manganese	...	0.20 max	1.0 max	...	0.50 max	0.30 max	1.5 max	1.5 max	1.2–2.0	0.10 max	0.10 max
Silicon	...	0.10 max	...	...	0.25 max	0.25 max	0.25 max	...	0.10 max	1.5–2.2	1.5–2.0
Tin	...	0.20–0.50	...	0.6 max	0.6 max	0.20 max	0.20 max	0.25 max	...	0.20 max	0.20 max
Zinc, max	...	0.10	0.20	0.8	...	...	0.30	0.30 max	...	0.50	0.50
Lead, max	...	0.01	0.01	0.02	...	...	...	0.03	0.02	0.05	0.05
Arsenic, max	...	...	...	...	...	...	...	...	...	0.15	0.15
Phosphorus, max	...	0.015	0.015	...	...	...	...	...	...	...	...
Other named elements	...	^B	...	...	...	...	...	^C	...	...	...

^A Iron content shall not exceed nickel content.

^B When the product is for subsequent welding applications and is so specified by the purchaser, chromium shall be 0.05 % max, cadmium 0.05 % max, zirconium 0.05 % max, and zinc 0.05 % max.

^C Chromium shall be 0.05 max and cobalt shall be 0.20 max.

established by agreement between the manufacturer and the purchaser.

6. Temper

6.1 *Temper*—Tempers available under this specification, and as defined in Practice B 601, are HR50, M10, M20, M30, O20, O25, O30, TQ30, TQ50 and TQ55.

7. Mechanical Properties

7.1 *Tensile*—Each alloy shall conform to the appropriate tensile property requirement specified in Table 2.

TABLE 2 Tensile Requirements

Temper Designation		Diameter or Distance Between Parallel Surfaces, mm	Tensile Strength, min, MPa	Yield Strength, min MPa at 0.5 % Extension Under Load	Elongation, min, % ⁴
Standard	Former				
Copper Alloy UNS No. C60600					
HR50	drawn and stress relieved	<i>rod and bar:</i>			
		12 and under	550	275	30
		over 12 to 25, incl	515	240	30
		over 25 to 50, incl	485	220	30
		over 50 to 80, incl	485	205	30
Copper Alloy UNS No. C61300					
HR50	drawn and stress relieved	<i>rod (round only):</i>			
		12 and under	550	345	30
		over 12 to 25, incl	515	310	30
		over 25 to 50, incl	495	275	30
		over 50 to 80, incl	485	240	30
HR50	drawn and stress relieved	<i>rod (hexagonal and octagonal) and bar:</i>	550	275	30
		12 and under			
		over 12 to 25, incl	515	240	30
		over 25 to 50, incl	485	220	30
Copper Alloy UNS No. C61400					
HR50	drawn and stress relieved	<i>rod (round only):</i>			
		12 and under	550	275	30
		over 12 to 25, incl	515	240	30
		over 25 to 50, incl	485	220	30
		over 50 to 80, incl	485	205	30
Copper Alloy UNS No. C61900					
HR50	drawn and stress relieved	<i>rod (round only):</i>			
		12 and under	620	345	15
		over 12 to 25, incl	605	305	15



Documents

Document Sharing Hub