



Standard Specification for Brass Plate, Sheet, Strip, And Rolled Bar¹

This standard is issued under the fixed designation B 36/B 36M; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

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

1. Scope

1.1 This specification covers brass plate, sheet, strip, and rolled bar of the following alloys:²

Nominal Composition

Copper Alloy UNS No. ³	Previously Used Designation	Nominal Composition	
		Copper, %	Zinc, %
C21000	1	95	5
C22000	2	90	10
C22600	...	87.5	12.5
C23000	3	85	15
C24000	4	80	20
C26000	6	70	30
C26800	8	66	34
C27200	9	63	37
C28000	...	60	40

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.³

2. Referenced Documents

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

2.2 ASTM Standards:

B 248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar⁴

B 248M Specification for General Requirements for

¹ This specification is under the jurisdiction of ASTM Committee B-5 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.01 on Plate, Sheet, and Strip.

Current edition approved Feb. 15, 1995. Published April 1995. Originally published as B 36 – 20 T. Last previous edition B 36 – 91a⁴.

² SAE Specifications CA210, CA220, CA230, CA240, CA260, CA268 and CA272 conform to the requirements for Copper Alloy UNS Nos. C21000, C22000, C23000, C24000, C26000, C26800, and C27200, respectively.

³ The UNS system for copper and copper alloys (see Practice E 527) is a simple expansion of the former standard designation system accomplished by the addition of a prefix “C” and a suffix “00.” The suffix can be used to accommodate composition variations of the base alloy.

⁴ Annual Book of ASTM Standards, Vol 02.01.

Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar [Metric]⁴

B 601 Practice for Temper Designations for Copper and Copper Alloys—Wrought and Cast⁴

E 8 Test Methods of Tension Testing of Metallic Materials⁵

E 8M Test Methods of Tension Testing of Metallic Materials [Metric]⁵

E 527 Practice for Numbering Metals and Alloys (UNS)⁶

3. Ordering Information

3.1 Orders for material under this specification should include the following information:

3.1.1 Quantity,

3.1.2 Name of material: brass,

3.1.3 Form of material: plate, sheet, strip, or rolled bar,

3.1.4 Alloy number (see 1.1),

3.1.5 Temper (see Section 5),

3.1.6 Dimensions: thickness and width, and length if applicable.

3.1.7 How furnished: rolls, stock lengths with or without ends, specific lengths with or without ends (see 8.4),

3.1.8 Type of edge, if required: slit, sheared, sawed, square corners, rounded corners, rounded edges, or full-rounded edges (see 8.6),

3.1.9 Type of width and straightness tolerances, if required: slit-metal tolerances, square-sheared-metal tolerances, sawed-metal tolerances, straightened or edge-rolled metal tolerances (see 8.3 and 8.5).

3.1.10 ASTM Specification B 36/B 36M, year of issue, and whether inch-pound or SI units are applicable (see 1.2).

3.1.11 Special tests or exceptions, if any.

3.2 In addition, when material is purchased for agencies of the U. S. Government, it shall conform to the Supplementary Requirements as defined in Specification B 248 when specified in the contract or purchase order.

4. Chemical Composition

4.1 The materials shall conform to the compositions prescribed in Table 1.

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

⁵ Annual Book of ASTM Standards, Vol 03.01.

⁶ Annual Book of ASTM Standards, Vol 01.01.

TABLE 1 Chemical Requirements

Copper Alloy UNS No.	Copper, %	Lead, max, %	Iron, max, %	Zinc
C21000 (95 Cu, 5 Zn)	94.0 to 96.0	0.03	0.05	remainder
C22000 (90 Cu, 10 Zn)	89.0 to 91.0	0.05	0.05	remainder
C22600 (87.5 Cu, 12.5 Zn)	86.0 to 89.0	0.05	0.05	remainder
C23000 (85 Cu, 15 Zn)	84.0 to 86.0	0.05	0.05	remainder
C24000 (80 Cu, 20 Zn)	78.5 to 81.5	0.05	0.05	remainder
C26000 (70 Cu, 30 Zn)	68.5 to 71.5	0.07	0.05	remainder
C26800 ^A (66 Cu, 34 Zn)	64.0 to 68.5	0.15	0.05	remainder
C27200 ^B (63 Cu, 37 Zn)	62.0 to 65.0	0.07	0.07	remainder
C28000 ^C (60 Cu, 40 Zn)	59.0 to 63.0	0.30	0.07	remainder

^A Material shall be free from beta constituent when examined at a magnification of 75 diameters.

^B Small amounts of beta constituent, if present, may interfere in some instances with severe forming or drawing; therefore, suitability for forming or drawing should be established between manufacturer and purchaser.

^C It is anticipated that this material will contain the beta constituent that may interfere with severe forming or drawing operations.

established by agreement between manufacturer or supplier and purchaser.

4.3 Either copper or zinc may be taken as the difference between the sum of all elements analyzed and 100 %. When all elements in Table 1 are analyzed, their sum shall be as shown in the table as follows:

C24000	99.8
C26000	99.7
C26800	99.7
C27200	99.7
C28000	99.7

5. Temper

5.1 *As Hot-Rolled (M20) Material*—The standard temper of sheet and plate produced by hot rolling is as designated in Table 2.

Copper Alloy UNS No.	Copper Plus Named Elements, % min
C21000	99.8
C22000	99.8
C22600	99.8
C23000	99.8

TABLE 2 Tensile Strength Requirements and Approximate Rockwell Hardness Values for Rolled Tempers

NOTE 1—Plate is generally available in only the as hot-rolled (M20) temper. Required properties for other tempers shall be agreed upon between the manufacturer and the purchaser at the time of placing the order.

Rolled Temper		Tensile Strength, ksi ^A		Tensile Strength, MPa ^B		Approximate Rockwell Hardness ^C							
Temper Designation		Min	Max	Min	Max	B Scale				Superficial 30-T			
Standard	Former					0.020 (0.508) to 0.036 in. (0.914 mm) incl		Over 0.036 in. (0.914 mm)		0.012 (0.305) to 0.028 in. (0.711 mm) incl		Over 0.028 in. (0.711 mm)	
						Min	Max	Min	Max	Min	Max	Min	Max
Copper Alloy UNS No. C21000													
M20	As hot-rolled	32	42	220	290	...	...	...	...	...	...	...	...
H01	Quarter hard	37	47	255	325	20	48	24	52	34	51	37	54
H02	Half-hard	42	52	290	355	40	56	44	60	46	57	48	59
H03	Three-quarter-hard	46	56	315	385	50	61	53	64	52	60	54	62
H04	Hard	50	59	345	405	57	64	60	67	57	62	59	64
H06	Extra hard	56	64	385	440	64	70	66	72	62	66	63	67
H08	Spring	60	68	415	470	68	73	70	75	64	68	65	69
H10	Extra spring	61	69	420	475	69	74	71	76	65	69	66	70
Copper Alloy UNS No. C22000													
M20	As hot-rolled	33	43	230	295	...	...	...	...	...	...	...	...
H01	Quarter-hard	40	50	275	345	27	52	31	56	34	51	37	54
H02	Half-hard	47	57	325	395	50	63	53	66	50	59	52	61
H03	Three-quarter-hard	52	62	355	425	59	68	62	71	55	62	58	64
H04	Hard	57	66	395	455	65	72	68	75	60	65	62	67
H06	Extra hard	64	72	440	495	72	77	74	79	64	68	66	69
H08	Spring	69	77	475	530	76	79	78	81	67	69	68	70
H10	Extra spring	72	80	495	550	78	81	80	83	68	70	69	71
Copper Alloy UNS No. C22600													
H01	Quarter-hard	42	52	290	355	29	58	29	58	39	58	39	58
H02	Half-hard	48	58	330	400	52	68	52	68	54	64	54	64
H03	Three-quarter-hard	53	63	365	435	61	73	61	73	59	68	59	68
H04	Hard	58	67	400	460	67	77	67	77	64	70	64	70