


# Copper Based Alloys

1 Excellent • 2 Very Good • 3 Good • 4 Fair • 5 Poor

HRB Rockwell Hardness, B Scale  
 HRE Rockwell Hardness, E Scale  
 HRC Rockwell Hardness, C Scale  
 BHN Brinell Hardness Scale

 No Data Available  
 metal not usually  
 used in this condition

Alloy	Similar Designation	Usual Condition	Castability	Machinability	Corrosion Resistance	Weldability	Hardenable	Density (g/cm <sup>3</sup> )	As-Cast Tensile Strength (psi)	As-Cast Yield Strength (psi)	As-Cast Elongation (%)	Annealed Hardness	Annealed Tensile Strength (psi)	Annealed Yield Strength (psi)	Annealed Elongation (%)	Heat Treated Hardness	Heat Treated Tensile Strength (psi)	Heat Treated Yield Strength (psi)	Heat Treated Elongation (%)	Heat Treated Hardness	Comments
Be Cu 10C (C82000)	MIL C 19454	Solution Treated Precipitation Hardened	3	1	3	4	Yes	8.8					40,000	9,000	20	HRB 45 max	90,000	50,000	5	HRB 90	Better electrical conductivity than Be Cu 20C.
Be Cu 20C (C82500)	AMS 4890 MIL C 11866 MIL C 19494	Solution Treated Precipitation Hardened	1	4	1	4	Yes	8.3					55,000	20,000	20	HRB 75 max	155,000	140,000	1	HRC 40	Easiest to cast. Most popular Be Cu alloy. Can be heat treated to strength and hardness of steel, with combined properties of electrical conductivity, corrosion, and wear resistance.
Be Cu 275 C (C82800)	MIL C 19464	Solution Treated Precipitation Hardened	2	4	2	4	Yes	8.1					70,000	40,000	15	HRB 90 max	180ksi	165ksi	3	HRC 44	Highest hardness. Readily cast. Properties similar to Be Cu 20.
Silicon Brass (C87500)	ASTM B584 MIL C 22087	As-Cast	2	2	2	2	No	8.3	60,000	35,000	16	HRB 55									Very good castability and toughness. High strength at high temperatures; good resistance to corrosion and pressure-tightness.
Silcon Bronze (C87300)	ASTM B763 MIL C 11866	As-Cast	3	3	3	3	No	8.3	45,000	28,000	12	HRB 50									Highest strength at elevated temperatures. Used in place of pure copper where strength is required.
Phosphur Bronze (C90700)	ASTM B427	As-Cast	4	2	2	3	No	8.8	45,000	25,000	30	HRB 45									Cast gears and blanks. Good wear and corrosion resistance. Retains ductility, tensile, and impact strengths at low temperatures.
Navy "G" (C90300)	ASTM B584 MIL C 22087	As-Cast	4	2	2	3	No	8.7	40,000	20,000	?	HRB 40									Bearings and bushings. General utility bronze for high pressure applications and severe conditions.
Navy "M" (C92200)	ASTM B61 ASTM B584	As-Cast	3	2	2	5	No	8.6	35,000	16,000	30	HRB 35									Valves and fittings. Readily machined.
Red Brass 85-5-5-5 (C83600)	ASTM B62 ASTM B584	As-Cast	2	2	2	3	No	8.8	30,000	20,000	20	HRB 30									All purpose alloy. Good machinability.
Yellow Brass (C85700)	ASTM B584	As-Cast	5	3	2	4	No	8.4	30,000	11,000	20	HRB 35									Good machinability. Often used for pipe fittings.
Manganese Bronze A (C86500)	ASTM B584 AMS 4860 MIL C 22087	As-Cast	4	2	1	4	No	8.3	71,000	28,000	30	HRB 80									Good for salt and fresh water environments.



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