

TIN BRONZES

CDA NUMBER	C90300		C90500		C90700	
Common Name	Navy G		SAE 62, 88-10-2		SAE 65, Phos Gear Brz	
COMPOSITION PERCENT	Min	Max	Min	Max	Min	Max
Copper (Cu)	86.0	89.0	86.0	89.0	88.0	90.0
Tin (Sn)	7.8	9.0	9.5	10.5	10.0	12.0
Lead (Pb)		0.25		0.25		0.5
Zinc (Zn)	3.5	5.0	1.5	3.0		0.5
Iron (Fe)		0.15		0.15		0.15
Antimony (SB)		0.2		0.2		0.2
Nickel (Ni)		0.8		0.8		0.5
Sulphur (S)		0.05		0.05		0.05
Phosphorous (P)		0.03		0.03		0.3
Aluminum (Al)		0.005		0.005		0.005
Silicon (Si)		0.005		0.005		0.005
Other (Total)						
NEAREST APPLICABLE CASTING STANDARDS						
ASTM (B Series)	B584		B584		B584	
SAE (J Series)	461, 462 (was 620)		461, 462 (was 62)		461, 462 (was 65)	
Federal (QQ-C- Series)	390		390			
Military (Mil-C- Series)	22229					
TYPICAL PROPERTIES	Typ	Min	Typ	Min	Typ	Min
Tensile Strength (ksi)	45	40	46	40	44	35
Yield Strength (.5% extension under load) (ksi)	20	18	22	18	22	18
Elongation (2 inch gauge length) (%)	30	20	30	20	20	10
Reduction of Area (%)	35		40			
Proportional Limit (ksi)	13					
Modulus of Elasticity (ksi)	14000		15000		16000	
Hardness (Brinell) (HB @ 500kg)	70		75		90	
Machinability (% of free cutting brass)	35		35		20	
Fatigue Strength (10 ⁸ cycles) (ksi)			13			
Impact Strength (Charpy) (ft-lb)	14					
Impact Strength (Izod) (ft-lb)			10			
Compressive Strength (0.001 in. set/in.) (ksi)	13		15			
Compressive Strength (0.010 in. set/in.) (ksi)			44			
Melting Range (Liquidus-Solidus)(F)	1570-1832		1570-1830		1505-1792	
Coefficient of Thermal Expansion (per F @ 68-400F)	0.000010		0.000010			
Thermal Conductivity (Btu/sq.ft./hr/F @ 68F)	43.2		43.2			
Specific Heat (Btu/lb/F @ 68F)	0.09		0.09		0.09	
Electrical Conductivity (% IACS @ 68F)	12		11			
Density (lb/cu.in. @ 68F)	0.318		0.315			
Pouring Temperature (Light Castings) (F)	2000-3000		2000-3000			
Pouring Temperature (Heavy Castings) (F)	1900-2100		1900-2100			
Patternmakers Shrinkage (in/ft)	3/16		3/16		3/16	
Drossing	Low		Low		Low	
Gassing	Medium		Medium		Medium	
Fluidity	Medium		Medium		High	
Shrinkage	Medium		Medium		Low	
Casting Yield	Medium		Medium		Medium	
Corrosion Resistance: Excellent for most hydrocarbons, seawater, food products and some acids.						
Wear Resistance: Excellent						
Applications: Bearings, bushings, pump impellers, pump bodies, piston rings, valve components, steam fittings, gears, seal rings.						

* Not Recommended



All mechanical properties listed are typical and not minimums. Always consult applicable specs and use good engineering judgment. Consult your foundry early in the design process.

St. Paul Brass and Aluminum Foundry

954 West Minnehaha Avenue • Saint Paul Minnesota 55104 • (651) 488-5567 Fax: (651) 488-0908