

HIGH STRENGTH YELLOW BRASS

CDA NUMBER		C86400		C86500	
Common Name		420; Free Machining Mn Bronze		421; 65,000 Tensile	
COMPOSITION PERCENT		Min	Max	Min	Max
Copper (Cu)		56.0	62.0	55.0	60.0
Tin (Sn)		0.5	1.0		1.0
Lead (Pb)		0.5	1.3		0.3
Zinc (Zn)		34.0	42.0	36.0	42.0
Iron (Fe)		0.4	2	0.4	2
Nickel (Ni)			0.8		0.8
Aluminum (Al)		0.5	1.5	0.5	1.5
Manganese (Mn)		0.1	1	0.1	1.5
Other (Total)					
NEAREST APPLICABLE CASTING STANDARDS					
ASTM (B Series)		B584		B584	
SAE (J Series)				461, 462 (was 43)	
Federal (QQ-C- Series)		390		390	
Military (Mil-C- Series)				22229	
TYPICAL PROPERTIES		Typ	Min	Typ	Min
Tensile Strength (ksi)		65	60	71	65
Yield Strength (.5% extension under load) (ksi)		24	20	25.8	25
Elongation (2 inch gauge length) (%)		20	15	40	20
Reduction of Area (%)		20		38	
Proportional Limit (ksi)		14		14.5	
Modulus of Elasticity (ksi)		14000		15400	
Hardness (Brinell) (HB @ 3000kg)		105		130	
Machinability (% of free cutting brass)		62		26	
Fatigue Strength (10 ⁸ cycles) (ksi)				21	
Impact Strength (Charpy) (ft-lb)		25		32	
Impact Strength (Izod) (ft-lb)		30		30	
Compressive Strength (0.001 in. set/in.) (ksi)		23		23.8	
Compressive Strength (0.010 in. set/in.) (ksi)				35.2	
Compressive Strength (0.100 in. set/in.) (ksi)		87		78.9	
Creep Strength (0.00001% per hour) (ksi)				28 @ 350F	
Melting Range (Liquidus-Solidus)(F)		1580-1616		1583-1616	
Coefficient of Thermal Expansion (per F @ 68-400F)		0.000011		0.000011	
Thermal Conductivity (Btu/sq.ft./hr/F @ 68F)		51		50	
Specific Heat (Btu/lb/F @ 68F)		0.09		0.09	
Electrical Conductivity (% IACS @ 68F)		19		22	
Density (lb/cu.in. @ 68F)		0.301		0.301	
Pouring Temperature (Light Castings) (F)		1900-2050		1900-2000	
Pouring Temperature (Heavy Castings) (F)		1750-1900		1750-1900	
Patternmakers Shrinkage (in/ft)		1/4		15/64	
Drossing		High		High	
Gassing		Low		Low	
Fluidity		Medium		Medium	
Shrinkage		High		High	
Casting Yield		Low		Low	
Corrosion Resistance:		Excellent, second only to the Aluminum Bronzes.			
Wear Resistance:		Very good			
Applications:		Both alloys are used in applications requiring toughness and strength, valve stems, gears, lever arms, bearings and liners. C86400 is free machining because of the lead.			

* 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

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