



HSM Wire International, Inc

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www.hsmwire.com



Alloy 521 - Phosphor Bronze, 8%C

Definition: C52100 Phosphor Bronze Alloy, which is a 8% Tin bronze distinguished by a very good combination of strength and electrical conductivity.

Applications: It is used for connector and current-carrying springs in contacts. Bridge bearing plates, thermostat bellows, coinage, cymbals, marine parts, electrical connectors, wire brushes, fuse clips, frame connectors, fasteners, lock washers, springs, well drill equipment, doctor blades, and truss wire

Nominal Composition:	Sn%	P%	Zn%	Fe%	Pb%	Cu%	Note* Copper plus additions equal 99.5% minimum
	7.5-8.5%	0.03-0.35%	0.20% Max	0.10% Max	0.05% Max	Balance	

Physical Properties

Heat Treated Condition	English Units	Metric Units
Melting Range	1620 - 1880°F	880-1020°C
Density	.318 lb/cu. in. @68 °F	8.80 gm/cm @ 20 °C
Specific Gravity	8.8	8.8
Coefficient of Thermal Expansion	0.0000101/°F (68-392°F)	0.0000182/°C (20 -200°C)
Thermal Conductivity	36 Btu-ft/sq ft-ft-hr-°F @ 68°F	0.15 cal/sq cm-cm-sec-°C @ 20°C
Electrical Resistivity (Annealed)	79.8 ohms circ mils/ft @ 68 °F	13.3 microhm-cm @ 20 °C
Electrical Conductivity (Annealed)	13% I.A.C.S @ 68 °F	0.0754 megmho/cm @20 °C
Specific Heat	0.09 Btu/lb/°F @ 68 °F	0.09 cal/gm/°C @ 20 °C
Modulus of Elasticity (Tension)	16,000 KSI	11,200 kg/sq mm

*To be used as a guideline only.

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Physical Properties

Heat Treated Condition	English Units		Metric Units	
Modulus of Rigidity (Torsion)	6000 KSI		4200 kg/sq mm	
Annealing Temperature	900 - 1250°F		480-675°C	
Stress Relief Temperature	300 - 450°F		150 - 230 °C	

Mechanical Properties

Properties	Conditions		
		T (°C)	Treatment
Poisson's Ratio	0.34	25	
Elastic Modulus (GPa)	117	25	
Tensile Strength (MPa)	379-965		
Yield Strength (MPa)	165-552		
Elongation (%)	70	25	(Flat products, rod, wire)

Round, Half Round & Square Wire

Temper	Tensile Strength KSI	Tensile Strength MPa	Yeild Strength .2% offset KSI / MPa
Annealed	53 - 68	365 - 470	17 - 32 / 117 - 220
1/4 Hard	74 - 91	510 - 625	68 - 85 / 468 - 585
1/2 Hard	95 - 115	655 - 795	80 - 105 / 550 - 724
3/4 Hard	113 - 135	780 - 930	105 - 130 / 724 - 895
Hard	125 - 150	860 - 1035	120 - 145 / 830 - 1000
Extra Hard	140 min.	965 min.	135 min. / 930 min.

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