

Coronze, or Alloy C638 is a high strength, cost effective, cobalt-modified aluminum silicon bronze which was developed for its corrosion resistant properties, particularly its oxidation resistance at elevated temperatures. A number of superior qualities, including surface characteristics, formability, strength and conductivity, make C638 an excellent choice for use in a wide range of applications including electrical connectors and spring contacts.

Chemical Composition

Copper¹	Remainder
Aluminum	2.5-3.1%
Cobolt	0.25-0.55%
Silicon	1.5-2.1%
Iron	0.20% Max
Lead	0.05% Max
Manganese	0.10% Max
Nickel	0.20% Max
Zinc	0.8% Max

¹ Cu + Named Elements, 99.5% min

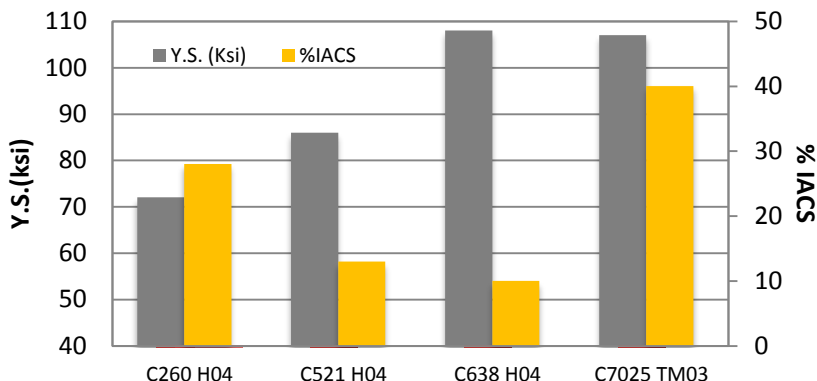


Figure 1: Comparison of Yield Strength and Electrical Conductivity performance of select high strength connector materials

Physical Properties

	English Units	Metric Units
Density	0.299 lb/in ³ @ 68°F	8.28 g/cm ³
Thermal Conductivity	22.0 BTU-ft/ft ² -hr-°F	38 W/m ² K
Electrical Resistivity	104 ohm circ mils/ft	17.4 microhm-cm
Electrical Conductivity (annealed)	10% IACS*	0.058 megamho/cm
Modulus of Elasticity	16,700,000 psi	115 kN/mm ²
Thermal Capacity(Specific Heat)	0.090 Btu/lb/F° @ 68°F	377.1 J/kg · °C @ 20°C
Coeff. Of Thermal Expansion 68-572°F (20-300°C)	9.5 PPM/°F	17.1 PPM/°C

*International Annealed Copper Standard

Mechanical Properties

Temper ¹	Tensile Strength		Yield Strength ²		% Elongation ²	Typical 90° Bend Formability GW/BW ³	
	ksi	N/mm ²	ksi	N/mm ²			
Annealed	77-87	530-600	56	385	33	-	-
1/4 Hard	90-102	620-705	82	565	16	0.5	1.5
1/2 Hard	100-112	690-770	93	640	10	0.8	2.0
3/4 Hard	105-117	725-805	99	685	7	1.0	2.5
Hard	114-126	785-870	108	745	4	1.5	3.5
Extra Hard	118-130	815-895	112	770	3	2.3	4.5
Spring	123-134	850-925	116	800	2	3.0	7.0
Extra Spring	130 min	895 min	119 min	820 min	2 Max		

¹ Mechanical properties subject to change. All tempers listed are made to a Tensile Strength specification unless otherwise noted.

² Nominal Values ³ DATA FOR REFERENCE ONLY. R/T = Bend Radius/Material Thickness <0.016" (0.4mm) thick, 11/16 (17.5mm) wide.

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