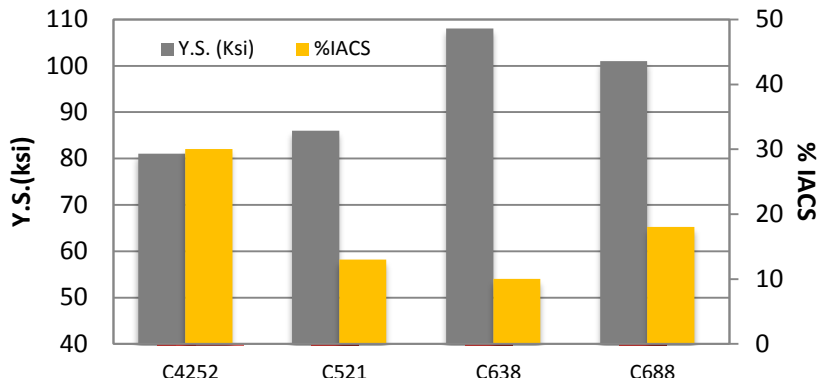


Developed by Olin Metals Research Laboratories, C688 is a high strength copper-zinc alloy modified with aluminum and cobalt. With exceptional strength and non-directional formability C688 can be used in applications including: high end wiring devices, automotive connectors and electronic interconnections. Offering improved stress relaxation resistance compared to C260 this alloy offers improved reliability but designers considering applications with elevated service temperatures should also consider C4252 or C7025.

### Chemical Composition

<b>Copper<sup>1</sup></b>	<b>Remainder</b>
<b>Aluminum</b>	<b>3.0-3.8%</b>
<b>Cobolt</b>	<b>0.25-0.55%</b>
<b>Zinc</b>	<b>21.3-24.1%</b>
Iron	0.20% Max
Lead	0.05% Max

<sup>1</sup> Cu + Named Elements, 99.5% min



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

### Physical Properties

	English Units	Metric Units
Density	0.296 lb/in <sup>3</sup> @ 68°F	8.20 g/cm <sup>3</sup>
Thermal Conductivity	47.0 BTU-ft/ft <sup>2</sup> -hr-°F	81 W/m <sup>2</sup> K
Electrical Resistivity	58.0 ohm circ mils/ft	9.6 microhm-cm
Electrical Conductivity (annealed)	18% IACS*	0.104 megamho/cm
Modulus of Elasticity	16,800,000 psi	116 kN/mm <sup>2</sup>
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)	10.1 PPM/°F	18.18 PPM/°C

\*International Annealed Copper Standard

### Mechanical Properties

Temper <sup>1</sup>	Tensile Strength		Yield Strength <sup>2</sup>		% Elongation <sup>2</sup>	Typical 90° Bend Formability GW/BW <sup>3</sup>	
	ksi	N/mm <sup>2</sup>	ksi	N/mm <sup>2</sup>			
Annealed	77-87	530-600	52	360	35	-	-
1/4 Hard	87-101	600-695	76	525	19	0.8	0.8
1/2 Hard	97-112	670-770	92	635	9	1.0	1.0
Hard	106-120	730-825	101	695	4	1.5	1.5
Extra Hard	113-127	780-875	108	745	2	3.0	3.0
Spring Hard	123-133	850-915	114	785	1 min	4.0	5.0
Extra Spring	125 min	860 min	112 min	770 min	2 max		

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

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

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