

Copper, such as the roofing on a house or that found on kitchen pots is likely what comes to mind when we hear the word that describes this elemental metal. While copper or C110 is the most commonly available copper product it often finds application out of sight where we depend on it most, such as motors in air conditioning units or the electric meter that connect houses to the electric grid. Refined electrolytically to reduce impurities levels, C110 is 99.90% pure copper and offers excellent electrical and thermal conductivity.

**Chemical Composition**

**Copper<sup>1</sup> 99.90% Min**

<sup>1</sup> Copper values includes Ag.

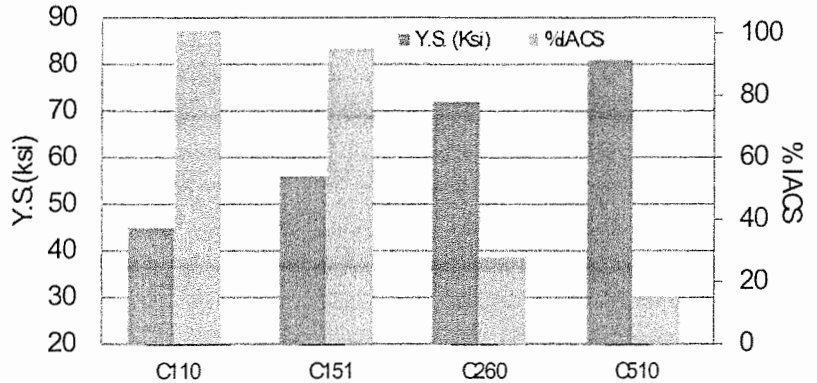


Figure 1: Comparison of Yield Strength and Electrical Conductivity performance of select Hard temper copper based materials.

**Physical Properties**

	English Units	Metric Units
Density	0.322 lb/in <sup>3</sup> @ 68°F	8.92 g/cm <sup>3</sup>
Thermal Conductivity	226 BTU-ft/ft <sup>2</sup> -hr-°F	390 W/mK
Electrical Resistivity	10.3 ohm circ mils/ft	1.71 microhm-cm
Electrical Conductivity (annealed)	101 % IACS*	0.586 megamho/cm
Modulus of Elasticity	17,000,000 psi	117 kN/mm <sup>2</sup>
Coeff. Of Thermal Expansion 68-572°F (20-300°C)	9.8 PPM/°F	17.64 PPM/°C

\*International Annealed Copper Standard

**Mechanical Properties**

Temper <sup>1</sup>	Tensile Strength		Yield Strength		% 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 (Soft) <sup>4</sup>	26-38	180-260	10	70	35	-	-
1/4 Hard	34-42	235-290	32	220	23	-	0.3
1/2 Hard	37-46	255-315	37	255	20	-	0.5
3/4 Hard	41-50	285-345	43	295	14	0.3	0.8
Hard	43-52	295-360	45	310	9	0.8	1.0
Extra Hard	47-56	325-385	50	345	4	1.3	1.5
Spring	50-58	345-400	52	360	3	1.8	2.0
Extra Spring	52 min	360 min	51 min	350 min	3 max		

<sup>1</sup> Mechanical properties subject to change. All rolled- tempers are accepted or rejected based on Tensile Strength.

<sup>2</sup> Nominal Values in 2" (51mm)

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

<sup>4</sup> Annealed temper are manufactured to a grain size only, consult mill for additional info.