

Cupro-Nickels are among the most attractive, durable and versatile copper alloys available. Offering unique properties such as excellent resistance to biological fouling, corrosion and stress corrosion cracking, these alloys are used in a range of applications from heat exchangers, ship components and condenser tubes of power plants to coinage and even touch surface on medical equipment. Nickel additions in these alloys allow designers to benefit from attractive color options ranging from lite rose to silver.

Chemical Composition

Copper ¹	Remainder
Nickel	29.0-33.0%
Iron	0.4-1.0%
Manganese	1.0% Max
Zinc	1.0% Max
Lead	0.05% Max

¹ Cu includes Ag; Copper plus named elements = 99.5%

² Ni Values Include Co

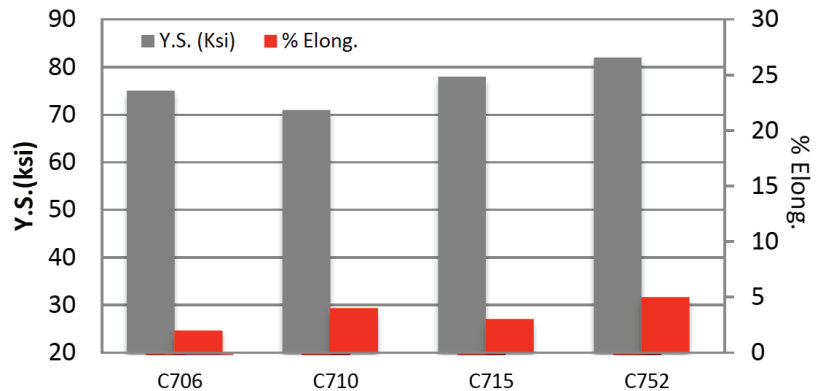


Figure 1: Comparison of Yield Strength and Elongation performance of select Hard temper Cupro-Nickel materials.

Physical Properties

	English Units	Metric Units
Density	0.323 lb/in ³ @ 68°F	8.94 g/cm ³
Thermal Conductivity	17 BTU-ft/ft ² -hr-°F	29 W/m ² K
Electrical Resistivity	225 ohm circ mils/ft	37.5 microhm-cm
Electrical Conductivity (annealed)	4.6% IACS*	0.0267 megamho/cm
Modulus of Elasticity	22,000,000 psi	152 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)	9.0 PPM/°F	16.2 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	52 min	360 min	28	195	30 min	
1/4 Hard	58-72	400-495	47	325	17	
1/2 Hard	66-80	455-550	68	470	6	
Hard	75-88	515-605	78	540	3	
Extra Hard	80-92	550-635	83	570	2	
Spring	84-94	580-650	86	595	1 min	

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.