ALLOY DATA

C21000
ASTM B36

wieland

Known as Gilding Metal, C210 is well known for its historic use in the “penny”. This versatile, low-cost alloy is often the choice of engineers for applications including deep drawn parts such as bullet jackets and coined products. The combination of moderate conductivity and improved strength make C210 a valuable option for electrical applications where performance requirements preclude the use of standard cooper.

Chemical Composition

Copper[1]	**94.0-96.0%**
Zinc	**Remainder**
Lead	0.05% Max
Iron	0.05% Max

[1] Copper plus named elements, 99.8%

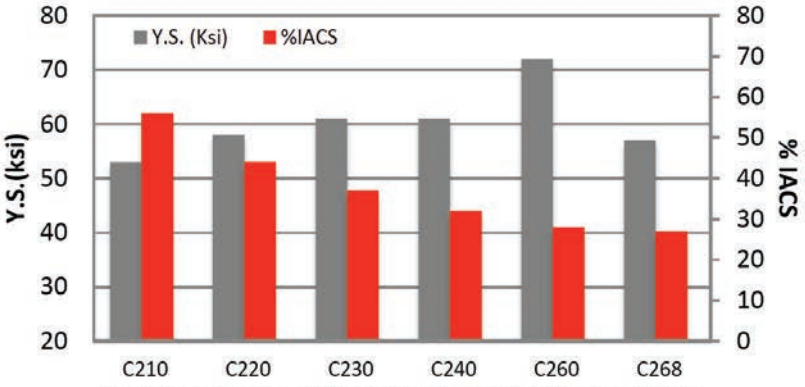

Figure 1: Comparison of Yield Strength and Electrical Conductivity performance of select Hard temper brass materials.

Physical Properties

	English Units	Metric Units
Density	0.320 lb/in^3 @ 68ºF	8.86 g/cm^3
Thermal Conductivity	135 BTU-ft/ft^2-hr-ºF	233 W/mK
Electrical Resistivity	18.5 ohm circ mils/ft	3.08 microhm-cm
Electrical Conductivity (annealed)	56% IACS*	0.325 megamho/cm
Modulus of Elasticity	17,000,000 psi	117 kN/mm^2
Coeff. Of Thermal Expansion		
68-572ºF (20-300ºC)	10.0 PPM/ºF	18.1 PPM/ºC

*International Annealed Copper Standard

Mechanical Properties

Temper[1]	Tensile Strength		Yield Strength		% Elongation[2]	Typical 90º Bend Formability GW/BW[3]	
	ksi	N/mm^2	ksi	N/mm^2			
Annealed (Soft)[4]	34-40	235-275	10	70	45	-	-
1/4 Hard	37-47	255-325	30	205	30	-	-
1/2 Hard	42-52	290-360	44	305	17	-	-
3/4 Hard	46-56	315-385	50	345	9	-	-
Hard	50-59	345-405	53	365	5	-	0.5
Extra Hard	56-64	385-440	59	405	2 Max	0.5	1.0
Spring	60-68	415-470	63	435	2 Max	1.0	1.8
Extra Spring	61-69	420-475	64	440	2 Max		

[1] Mechanical properties subject to change. All rolled- tempers are accepted or rejected based on Tensile Strength.

[2] Nominal Values in 2" (51mm)

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

[4] Annealed temper are manufactured to a grain size only, consult mill for additional info.