



# TEMCO ALLOY C64700

## TECHNICAL DATA SHEET

*UNCONTROLLED COPY*

**COMMON USES:** Copper alloy C64700 is a high strength non-magnetic alloy with medium electrical and thermal conductivity properties. The alloy is used for a wide variety of applications ranging from threaded fasteners to rotor bar, to resistance welding electrode holders. The alloy has also found use as a mold material, where its high strength, good thermal conductivity, and resistance to annealing properties have proven very valuable. Consult our Sales Department to discuss your specific applications.

CHEMISTRY	
ELEMENT	COMPOSITION %
Nickel, including Cobalt	1.6 – 2.2
Silicon	0.40 – 0.8
Lead (max.)	0.10
Iron (max.)	0.10
Zinc (max.)	0.50
Copper & Named Elements	99.5 (min.)

Melting Point (liquidous)	1995° F (1090° C)
Melting Point (solidous)	1940° F (1060° C)
Density	0.320 lb/cu in (8.88 gm/cu cm @ 20° C)
Specific Gravity	8.88
Coefficient of Thermal Expansion	9.8 x 10 <sup>-6</sup> /F° (68°F to 572° F)
Thermal Conductivity <sup>(B)</sup>	98-106 BTU/sq ft/ft/hr/°F @ 68° F (20° C)
Thermal Capacity (Specific Heat)	0.092 BTU/lb./°F @ 68°F (20° C)
Electrical Conductivity <sup>(A)</sup>	21-24 % IACS @ 68° F (20° C)
Electrical Conductivity <sup>(B)</sup>	37-45 % IACS @ 68 ° F (20° C)

<sup>(A)</sup> As solution annealed

<sup>(B)</sup> After solution annealed-drawn-precipitation harden

CAPABILITY FOR BEING COLD WORKED	EXCELLENT
CAPABILITY FOR BEING HOT WORKED	EXCELLENT
HOT WORKING TEMPERATURE	1300° - 1600° F 705° - 870° C
SOLUTION ANNEALING TEMPERATURE	1375° - 1475° F 745° - 800° C

SOFT SOLDERING	EXCELLENT
SILVER ALLOY BRAZING	EXCELLENT
OXYACETYLENE WELDING	GOOD
CARBON ARC WELDING	POOR
RESISTANCE WELDING	GOOD

### Precipitation Hardening Heat Treatment

Forms	Diameter or Distance Between Parallel Surfaces, <sup>A</sup> in. (mm)	Temperature		Time at Temperature, in minutes
		°F	°C	
All	Under 0.050 (1.27)	800	427	90
	0.050 to 1.000 (1.27 to 2.54), incl.	850	454	90
	Over 1.000 (2.54)	850	454	120

<sup>A</sup>For rectangular bar, the thickness dimension applies.

**MISCELLANEOUS INFORMATION:**

MACHINEABILITY RATE\* 30

NEAREST APPLICABLE ASTM SPEC: *B411*

\*Free Machining Brass = 100

<b>Required Mechanical Properties for Material in the TFOO (Precipitation Hardened (AT)) Condition</b>						
Form	Diameter or Distance Between Parallel Surfaces, inches (mm)	Tensile Strength, min.		Yield Strength at 0.5 % Extension Under Load, min.		Elongation <sup>A</sup> in 4D, min. %
		ksi <sup>B</sup>	MPa	ksi <sup>B</sup>	MPa	
<i>Rod:</i>						
Round	3/32 to 1 ½ (2.38 to 38.1), incl.	90	620	75	515	8
	Over 1 ½ to 2(38.1 to 50.8), incl.	80	550	70	485	8
Hexagonal & Octagonal	1/8 to 1 ½ (3.18 to 38.1), incl.	90	620	75	515	8
	Over 1 ½ to 2(38.1 to 50.8), incl.	80	550	70	485	8
<i>Bar:</i>						
Square	Over 0.188 to 1(4.78 to 25.4), incl.	90	620	75	515	8
	Over 1 to 1 ½(25.4 to 38.1) incl.	80	550	70	485	8
Rectangular	Over 0.188 to 1 ½(4.78 to 38.1) thick	80	550	70	485	8
	Up to 2 ½ (63.5) wide, incl.					

<sup>A</sup>Elongation in 4 x diameter or thickness, but in any case a minimum gage length of 1-inch (25.4 mm) shall be used.<sup>B</sup>ksi= 1000 psi.