



# FISK MA19C Leaded Nickel Copper UNS C19160 / CuNiPb1P

MA19C is a free machining, precipitation hardened leaded-nickel copper alloy featuring both high strength and electrical conductivity. Exhibiting excellent resistance to fatigue and thermal stress relaxation, MA19B / C19150 is very well suited for critical and high-reliability machined female electrical connector components such as spring contacts and coaxial pins.

Fabrication Indices	
Machinability	80
Cold Working	good
Hot Working	poor
Brazing	good
Soldering	excellent
Welding	poor

Available Forms
Rod and Wire, round

Chemical Composition
99.5% min Copper + Named Elements
0.8-1.2% Lead
0.8-1.2% Nickel
0.15-0.35% Phosphorus
0.05% max Iron, Tin, & Zinc

## Mechanical Properties

### ○ Round Rod

TEMPER NAME	TEMPER CODE	TENSILE STRENGTH	YIELD STRENGTH	ELONGATION	MILL LIMITS
		min, ksi (MPa)	min, ksi (MPa)	min, %	
1/4 HT	TL01	70 (485)	60 (415)	8	0.0394 - 0.3150" (1 - 8 mm)
1/2 HT	TL02	80 (550)	70 (485)	5	
3/4 HT	TL03	85 (585)	75 (515)	3	
HT	TL04	90 (620)	80 (550)	2	

### ○ Round Wire

TEMPER NAME	TEMPER CODE	TENSILE STRENGTH	YIELD STRENGTH	ELONGATION	MILL LIMITS
		min, ksi (MPa)	min, ksi (MPa)	min, %	
1/4 HT	TL01	70 (485)	60 (415)	4	0.0100 - 0.2362" (0.25 - 6 mm)
1/2 HT	TL02	80 (550)	70 (485)	3	
3/4 HT	TL03	85 (585)	75 (515)	2	
HT	TL04	95 (655)	85 (585)	1	

## Physical Properties

Melting Point (Liquidus)	1980 °F	1082 °C
Melting Point (Solidus)	1900 °F	1038 °C
Annealing Range (min - max), 1 hr	1290 - 1380 °F	700 - 750 °C
Density	0.320 lb/in <sup>3</sup>	8.86 gm/cm <sup>3</sup>
Electrical Resistivity (Annealed)	18.9 Ω-cir-mil/ft @ 68 °F	3.13 μΩ-cm @ 20 °C
Electrical Conductivity (Annealed)	55% IACS @ 68 °F	0.320 MS-cm @ 20 °C
Thermal Conductivity	146 Btu/ft <sup>2</sup> /ft-hr/°F @ 68 °F	253 W/m-K @ 20 °C
Coefficient of Thermal Expansion	9.8 x 10 <sup>-6</sup> per °F (68-572 °F)	17.6 x 10 <sup>-6</sup> per °C (20-300 °C)
Modulus of Elasticity (Tension)	18,000 ksi	124,000 MPa
Modulus of Rigidity	6,000 ksi	41,000 MPa

The information provided on this page is for reference purposes only.

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