

# Copper-Iron

# C194

Alloy C194 is a first generation high performance alloy used worldwide. C194 combines good electrical conductivity with high tensile strength, good solderability and plateability. Applications include connectors, semiconductor pins and leadframes, sockets and mass terminations.

## Mechanical Properties

ROUND & SQUARE WIRE...as drawn	
Temper	Tensile Strength PSI
Annealed	40-58,000
1/4 Hard	50-65,000
1/2 Hard	60-75,000
Hard	70-85,000
ExtraHard	80-95,000
Spring	90,000 Min.

  

ROLLED FLAT WIRE...wire other than square	
Temper	Tensile Strength PSI
Annealed	40-63,000
1/2 Hard	53-63,000
Hard	60-70,000
Extra Hard	67-73,000
Spring	70-76,000
Extra Spring	73-80,000

Note: Flat wire sections having a 3:1 width to thickness ratio or less are by commercial convention processed to the same tensile strength values as round or square wire.

## Physical Properties

Physical Properties	English Units	Metric Units
Melting Point (Liquidus)	1990°F	1090°C
Melting Point (Solidus)	1980°F	1080°C
Density	.322 lb/cu in @ 68°F	8.91 gm/cu cm
Thermal Conductivity (Annealed)	1050 Btu ft/sq ft hr °F @ 68°F	.625 cal cm/sq cm sec °C @ 20°C
Coefficient of Thermal Expansion	.0000098 per °F (68-572°F)	.0000179 per °C (20-300°C)
Electrical Resistivity (Annealed)	15 ohms (cir mil/ft) @ 68°F	2.54 microhm/cm @ 20°C
Electrical Conductivity (Annealed)	65% IACS*	.377 megmho/cm @ 20°C
Modulus of Elasticity	17,500,000 psi	12,300 kg/sq mm

\*International Annealed Copper Standard

## Conversion Factors Metric Tensile Strengths

$$\text{kg/mm}^2 = \text{KSI} \times .7031$$

$$\text{Newtons/mm}^2 = \text{KSI} \times 6.895$$

or  
MPa



## Chemical Composition

Nominal Composition	
Copper	97.4%
Iron	2.4%
Phosphorus	0.03%
Zinc	0.1%
Composition Limits	
Copper	Remainder
Iron	2.1 - 2.6%
Phosphorus	0.015 - 0.15%
Zinc	0.05 - 0.2%
Lead	0.03% Max.

## Specifications

ASTM B250  
ASTM B465

## Mill Limits

Round	.0010 - .1285 inch .0254 - 3.264 mm
Square and Rectangular	.0100 - .0808 inch .2540 - 1.905 mm Corner Radius as Specified
Flat	Thickness: .0100 - .0500 inch .2540 - 1.270 mm Width: .0150 - .2500 inch .3810 - 6.350 mm Edge Condition as Specified
Shapes	Special Shapes and Sizes Produced to Order

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