

# HIGH PERFORMANCE COPPER ALLOYS

## Flat, Shaped and Round Wire

### Applications

Electrical/electronic applications where higher strength levels are required while maintaining good electrical conductivity: Heating elements; Cable shielding; Spring; Electrical contact; Semiconductor lead frames; Spring pins; and Wave washers.

### Description

These alloys exhibit good to excellent corrosion resistance with medium to high thermal and electrical conductivity. They offer higher strength levels than pure copper alloys and some are heat treatable.

### Chemistry Typical

UNS NUMBER	COPPER*	IRON	NAMED	BERYLLIUM	OTHER
C16200	Balance	0.02 max	07 - 1.2 Cd	n/a	n/a
C17200	Balance	n/a	n/a	1.80 - 2.0	0.20 Al, 0.20 Co, 0.20 Si
C17500	Balance	0.10 max	2.4 - 2.7 Co	0.4 - 0.7	0.20 Al, 0.2 Si
C18200	Balance	0.10 max	0.6 0 1.5 Cr	n/a	0.05 Pb, 0.10 Si
C19400	97.0 min	2.1 - 2.6	0.015 - 0.15 P	n/a	0.05 - 0.20 Zn, 0.03 Pb
C19500	96.0 min	1.0 - 2.0	0.10 0 - 1.0 Sn	n/a	0.01 - .35 P, 0.30 -1.3 Co
C19700	Balance	0.30 - 1.2	0.20 - 0.40 P	n/a	0.20 Sn, 0.20 Si, 0.05 Pb

\* Contact Ulbrich Wire for request regarding the availability of other copper alloys.

\* Contact Ulbrich Technical Department for limits for additional trace elements and impurity levels.

\* Copper Values include Silver.

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## Physical Properties

Typical Density: 0.322 lbs/in<sup>3</sup>, 8.92 g/cm<sup>3</sup>

Electrical Conductivity: (% IACS at 68°F 20°C, annealed): 20-90%

Mean Coefficient of Thermal Expansion:  $\mu\text{in/in-}^\circ\text{F}$  ( $\mu\text{m/m-}^\circ\text{C}$ )  
68 - 572 °F: 9.6 - 9.7

Thermal Conductivity: BTU-in/hr-ft<sup>2</sup>-°F  
68 °F: 60 - 185

Modulus of Elasticity: KSI  
17 - 18.5 x 10<sup>3</sup> in tension

## Forms

Profile, Round, Flat, Square

## Mechanical Properties at Room Temperature

### Properties: Annealed Typical

Ultimate Tensile Strength: 35 - 85 KSI (241 - 586 MPa)

Yield Strength: 11 - 25 KSI (71 - 172 MPa)

Elongation: 20% min

### Properties: Tempered

High performance copper alloys can be cold worked to various tempers.

*\* Actual physical and mechanical properties are alloy dependent. Contact Ulbrich Technical Service for alloy specific properties.*

## Additional Properties

### Corrosion Resistance

Contact Ulbrich Wire for specific information.

### Wire Finishes

XC - Extra clean. Annealed or annealed and cold rolled.

Contact Ulbrich Wire with special finish requests.

### Heat Treatment

Alloys 162, 172 and 175 are hardenable by heat treatment.

### Welding

Contact Ulbrich Wire for specific information.

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