

Properties of Copper and Copper Alloys

UNS ALLOY NO.	ALLOY NAME	CHEMICAL COMPOSITION (%)		DENSITY (LB/CU IN)	ELECTRICAL CONDUCTIVITY (%IACS @ 68 F)	RESISTIVITY (OHMS-CIRC. MIL/FT)	APPROXIMATE MELTING POINT (°F)	MECHANICAL PROPERTIES					
								TENSILE STRENGTH (K PSI)		YIELD STRENGTH (K PSI)		ELONGATION (%)	
		Cu	OTHER					HARD	SOFT	HARD	SOFT	HARD	SOFT
C10100	Certified OFHC Copper	99.99 Min.	—	.323	101	10.3	1981	55	34	50	11	6	36
C10200	OFHC Copper	99.95 Min.	—	.323	101	10.3	1981	55	34	50	11	6	36
C11000	ETP Copper	99.90 Min.	0.04	.323	100	10.3	1949	55	34	50	12	5	36
C15000	Zirconium Copper	99.85	Zr .15	.321	93	11.2	1796	64	30	62	13	1.5	30
C17200	Beryllium Copper	98.1	Be 1.9	.298	22	46.2	1590	152	68	125	28	1	42
C26000	Cartridge Brass	70	Zn 30	.308	28	37.0	1680	109	52	68	21	5	30
C51000	Phosphor Bronze	94.8	Sn 5.0 P .2	.320	15	69.1	1750	110	51	85	21	5	49

Properties are nominal values, and should not be used for specification purposes. Elongation values are generally size dependent.

Certified OFHC Copper (UNS C10100)

This is an unalloyed, high purity copper that has excellent forming and brazing characteristics, as well as resistance to hydrogen embrittlement at elevated temperatures. It has good solderability and corrosion resistance, and may be used in any high current application. Both grades of OFHC copper are available in round and shaped wire and may be substituted for ETP copper wherever optimal properties of copper are desired.

OFHC Copper (UNS 10200)

OFHC copper has 99.95% minimum copper (silver counted as copper) and is produced by converting cathodes in a continuous casting and rolling process into copper rod. Typical uses include bus bars or any electrical conductor, and it may be specified as a special magnet wire conductor.

ETP Copper (UNS C11000)

Electrolytic tough pitch copper is intentionally alloyed with oxygen to achieve the best combination of conductivity, capacity for being cold worked, and economy. This is the most widely used copper for wire conductors and is available in round, square and rectangular shapes.

Zirconium Copper (UNS C15000)

This copper alloy exhibits high conductivity, excellent solderability, and good strength. Unlike ETP and the OFHC coppers, zirconium copper resists softening at higher temperatures. Typical applications include switches, high current interconnects, terminal pins, welding tips, and other applications where high temperatures exist.

Beryllium Copper (UNS C17200)

This alloy is characterized by very high strength and good electrical conductivity. Normally supplied in age-hardenable tempers, beryllium copper has good to excellent cold workability. This alloy is available as bare wire or it can be film insulated. Typical uses include switch parts, springs, fuse clips, connectors, and contacts.

Cartridge Brass (UNS 26000)

Cartridge brass has good conductivity and strength, but poor solderability due to its high zinc content. This copper alloy is widely used for cold-headed products such as machine and wood screws, rivets, and fasteners. It may also be used as an economical spring material.

Phosphor Bronze

This alloy is widely used for most types of springs because of its high strength and resistance to corrosion and fatigue. It is also used in switches, relays, contacts, and fasteners.