



# COPPER BASE ALLOYS

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Long electrode life is of paramount importance to the user of resistance welding equipment. Selection of the proper CMW alloy or combination of alloys will help to give improved weld strength and electrode life.

CMW electrodes are fabricated from alloys selected from the results of laboratory and practical field tests. For special problems, CMW engineers will make recommendations based on their years of experience.

## Typical Physical and Mechanical Properties of Copper Based Alloys

Copper Based Alloys	Condition	Principal Elements	R.W.M.A. Alloy Number	Hardness Rockwell	Electrical Conductivity %I.A.C.S.	Ultimate Tensile Strength, psi	Elongation % in 2"	Permanent Softening Begins at	
								°C	°F
CLASS 1 (1.15000)	Wrought**	Copper, Zirconium	1.15000	70 B	90	66,000	10	500	930
CLASS 2 (2.18200)	Cast	Copper, Chromium	2.18200	70 B	80	50,000	20	500	930
	Wrought***			83 B	85	75,000	15	500	930
CLASS 2 (2.18150)	Wrought***	Copper, Chromium, Zirconium	2.18150	83 B	85	75,000	15	500	930
CLASS 3 (3.18000)	Wrought	Copper, Nickel, Silicon, Chromium	3.18000	94 B	48	100,000	13	455	850
	Cast			90 B	48	85,000	10	455	850
CLASS 3 (3.17510)	Wrought	Copper, Nickel, Beryllium	3.17510	100 B	48	110,000	10	455	850
CLASS 4 (4.17200)	Cast	Copper, Beryllium	4.17200	38 C	20	110,000	2	375	710
	Wrought			38 C	23	170,000	4	375	710
Copper	Cast	Pure Copper	—	30 B	95	25,000	50	200	390
	Wrought			40 B	100	40,000	35	200	390

Note: All properties shown are TYPICAL and should not be used for specifications

\*\* Cold drawn bars up to 5/8" diameter

\*\*\* Heat treated and cold drawn bars up to 1" diameter

## TYPICAL USAGE

**RWMA CLASS 1 (1.15000)** Copper, Zirconium material is recommended for spot welding of coated steels and high conductivity materials, excluding copper and silver.

**RWMA CLASS 2 (2.18200)** Copper, Chromium material is recommended for spot and seam welding cold and hot-rolled steels and coated materials as well as current carrying shafts and arms, back-up bars for both resistance and arc welding and electrical current carrying structural parts and springs.

**RWMA CLASS 2 (2.18150)** Copper, Chromium, Zirconium is recommended for spot and seam welding cold and hot rolled steels. It is often used for galvanized and coated steel.

**RWMA CLASS 3 (3.18000)** this is a Beryllium free copper product with properties similar to beryllium coppers and able to function in most Class 3 applications.

**RWMA CLASS 3 (3.17510)** Copper, Beryllium material is recommended for spot and seam welding stainless steel and high temperature heat resisting alloys requiring high weld forces, flash welding dies, back-up bars, projection welding electrodes, and high strength, high conductivity electrical components and springs.

**RWMA CLASS 4 (4.17200)** Copper, Beryllium material is recommended for flash welding dies, springs, electrical components, high strength backing material for brazed assemblies and wire guides.