Alloy Selector Guide and Welding Procedures

Copper and Brass

Cronatron

Stick Electrodes

C/D	625	(110,000 PSI)
A	667	(35,000 PSI)

MIG Wires

C/D	625M	(110,000 PSI)
B	665M	(58,000 PSI)

TIG Wires

C/D	625T	(110,000 PSI)
B	665T	(58,000 PSI)

Certanium®

Stick Electrodes

C/D	425	(100,000 PSI)

T = TIG
M = MIG

Bead Profiles and Techniques

Desired Bead Profile	Fillet welds should be slightly concave with smooth transitions.
Technique	Multiple torch angles and weave techniques are acceptable.
Helpful Hints	Cleanliness of base metal and filler metal is critical to success. All metals listed react strongly to the atmosphere and inert shielding is used.
Base Metal I.D.	Aluminum bronzes tend to be gold in color while pure copper can be darker with a slight reddish tint.

Group	Description	Common Metal Grades
A	Pure Coppers	Pure Copper
B	Most Bronzes	Silicon Bronze, Phosphor Bronze
C	Aluminum Bronzes	Aluminum Bronze, Silicon Bronze, Copper-Nickel Alloys, Copper-Zinc Alloys, Manganese Bronze, Most Dissimilar Bronzes, Metal to Metal Wear
D	Dissimilars	Phosphor Bronze, Copper or Bronze Castings (For thick sections preheat to 400°F)

Helpful Hints: Welding copper-based alloys requires significantly higher current than welding steels due to high thermal conductivity. Preheat can be used when weld bead appears cold or on mostly pure copper because of high thermal conductivity. Welding-related distortion of metal is significantly higher in copper and bronze alloys.

Group	Thickness	Preheat °F	Postheat °F	Minimum Interpass °F	Maximum Interpass °F	Description
A – Pure Copper	<1"	600°	N/A	600°	N/A	These alloys have very high thermal conductivity, which creates the need for high preheat. Using Argon with some Helium will improve penetration and is very helpful, particularly on thicker or larger sections.
	1" – 2"	700°	N/A	700°	N/A	
	>2"	800°	N/A	800°	N/A	
B – Most Bronzes (Silicon, Phosphor, Beryllium)	<1"	200°	N/A	200°	N/A	A modest preheat is sometimes used to overcome the high thermal conductivity of these copper alloys. Using Argon with some Helium will improve penetration and is very helpful, particularly on thicker or larger sections.
	1" – 2"	300°	N/A	300°	N/A	
	>2"	400°	N/A	400°	N/A	
C – Aluminum Bronze	<1"	70°	Depends	N/A	300°	On thin sections, little or no preheat is typically used in this classification. Using Argon with some Helium will improve penetration and is very helpful, particularly on thicker or larger sections.
	1" – 2"	150°	Depends	N/A	300°	
	>2"	200°	Depends	N/A	300°	
D – Dissimilar	<1"	200°	N/A	200°	N/A	Minimize dilution when welding to iron (Fe) based materials. The preheat on the copper or brass material needs to be about 200°F to 600°F (93°C to 316°C) higher. Sometimes buttering the steel is necessary.
	1" – 2"	300°	N/A	300°	N/A	
	>2"	400°	N/A	400°	N/A	

For optimal operating parameters, refer to tech sheets or the Cronatron Maintenance Welding Guide (C555).