Copper Alloy Welding Wires

Type
Phosphor Bronze-A

SM-CuSn A (TIG : ST-CuSn A)

Conformances

AWS A5.7	**ERCuSn-A**
EN ISO 14640	**CuSn6P**
GB/T9460	**SCu5180**

Shielding Gas

Argon 100%

Key Features

- Wear resistance
- Argon arc welding of copper alloys and surfacing of steel
- Pre-heat suggested for large size products
- Pulse argon arc welding recommended for multi-layer hard facing on steel

Typical Application

- Welding of copper with Cu-Sn alloy
- Good for butt joining welding of brass with steel

Chemical Composition (%)

Cu	Al	Fe	Mn	Ni	P	Pb	Si	Sn	Zn	Others
bal.	0.01	-	-	-	0.10-0.35	0.02	-	4.0-6.0	-	0.50

Mechanical Properties

Tensile Strength (Rm)	Elongation
320 ~ 360 N/mm^2	20 ~ 25 %

Applicable Joining Processes

Applicable Joining Processes

Alloy	UNS No.	Oxyfuel Gas Welding	SMAW	GMAW	GTAW	Resistance Welding	Solid-state Welding	Brazing	Soldering	Electron Beam Welding
ETP Copper	C11000-C11900	NR	NR	F	F	NR	G	E	G	NR
Oxygen-Free Copper	C102000	F	NR	G	G	NR	E	E	E	G
Deoxidized Copper	C12000-C123000	G	NR	E	E	NR	E	E	E	G
Beryllium-Copper	C17000-17500	NR	F	G	G	F	F	G	G	F
Cadmium/Chromium Copper	C16200-C18200	NR	NR	G	G	NR	F	G	G	F
Red Brass – 85%	C23000	F	NR	G	G	F	G	E	E	-
Low Brass – 80%	C24000	F	NR	G	G	G	G	E	E	-
Cartridge Brass – 70%	C26000	F	NR	F	F	G	G	E	E	-
Leaded Brasses	C31400-C38590	NR	NR	NR	NR	NR	NR	E	G	-
Phosphor Bronzes	C50100-C52400	F	F	G	G	G	G	E	E	-
Copper Nickel 30%	C71500	F	F	G	G	G	G	E	E	F
Copper Nickel 10%	C70600	F	G	E	E	G	G	E	E	G
Nickel Silvers	C75200	G	NR	G	G	G	G	E	E	-
Aluminum Bronze	C61300 C61400	NR	G	E	E	G	G	F	NR	G
Silicon Bronzes	C65100 C65500	G	F	E	E	G	G	E	G	G

E=Excellent **G**=Good **F**=Fair **NR**=Not Recommended | Courtesy of American Welding Society Welding Handbook 8th Ed. Vol. 3 Part 1

Recommended Welding Amperage

SMAW (DCRP)

Diameter	Amperes*
3/32”	50-110
1/8”	90-160
5/32”	130-180
3/16”	150-225

GMAW (DCRP) Gas: 100% Ar or 75/25 Ar/He

Diameter	Voltage	Amperes*
.035”	20-26	100-200
.045”	22-28	100-250
5/32”	29-32	250-400
3/16”	32-34	350-500

GTAW (DCSP, ACHF) Gas : 100% Ar or He

Diameter	Amperes* (DCEN)	Amperes* (ACHF)
1/16”	70-120	70-150
3/32”	120-160	140-230
1/8”	170-230	225-320
5/32”	220-280	175-300
3/16”	280-330	200-320

*Use low range for iron- or nickel-based alloys; middle range for bronze alloys; high range for copper

Suggested Filler Metal Selection

Suggested Filler Metal Selections for Copper-based Alloy

	Copper	Phosphor Bronze	Silicon Bronze	Yellow (Naval) Brass	Manganese Bronze	Navy G	Red Brass	Copper Nickel	Nickel Al Bronze
Copper	Deox (538)								
Phosphor Bronze	PHB, Deox (538)	PHB, Deox (204)							
Silicon Bronze	PHB, Deox (538)	PHB, SB (66)	SB (66)						
Yellow (Navel) Brass	SB, PHB, Deox (538)	PHB (316)	AlB-A2, SB (66)	AlB-A2 (316)					
Manganese Bronze	PHB, Deox (538)	AlB-A2, PHB (204)	AlB-A2, SB (66)	AlB-A2, PHB (316)	AlB-A2, PHB, Ni Bronze (149)				
Navy G	PHB, Deox (538)	PHB (204)	AlB-A2, SB (66)	PHB (316)	AlB-A2, PHB (316)	AlB-A2, PHB (316)			
Red Brass	PHB, Deox (538)	PHB (260)	AlB-A2, SB (66)	PHB (316)	AlB-A2, PHB (316)	AlB-A2, PHB (316)	AlB-A2, PHB (204)		
Copper Nickel	AlB-A2, Deox (538)	PHB, AlB-A2 (204)	AlB-A2 (66)	AlB-A2 (66)	AlB-A2 (149)	AlB-A2 (66)	AlB-A2 (66)	CuNi67 ERCuNi	
Nickel Aluminum Bronze	AlB-A2, Deox CuNiAl (538)	PHB (204)	AlB-A2 (66)	AlB-A2, CuNiAl (260)	AlB-A2 (149)	AlB-A2 (260)	AlB-A2 (316)	AlB-A2 (316)	CuNiAl (149)
Low Alloy Steel	AlB-A2 (538)	PHB, AlB-A2 (204)	AlB-A2 (204)	AlB-A2 (316)	AlB-A2 (204)	AlB-A2, PHB (260)	AlB-A2 (316)	AlB-A2 (204)	AlB-A2 (204)
Low Carbon Steel	AlB-A2 (538)	PHB, AlB-A2 (204)	AlB-A2 (66)	AlB-A2 (260)	AlB-A2 (66)	AlB-A2, PHB (316)	PHB (316)	AlB-A2 (66)	AlB-A2 (149)
Medium Carbon Steel	AlB-A2 (538)	PHB, AlB-A2 (204)	AlB-A2 (66)	AlB-A2 (260)	AlB-A2 (204)	AlB-A2, PHB (316)	AlB-A2 (316)	AlB-A2 (204)	AlB-A2 (204)
High Carbon Steel	AlB-A2 (538)	PHB, AlB-A2 (260)	AlB-A2 (204)	AlB-A2 (260)	AlB-A2 (260)	AlB-A2, PHB (316)	AlB-A2 (316)	AlB-A2 (260)	AlB-A2 (260)
Cast Iron	AlB-A2 (538)	PHB, AlB-A2 (204)	AlB-A2, SB (149)	AlB-A2 (316)	AlB-A2 (204)	AlB-A2, PHB (316)	AlB-A2, PHB (316)	AlB-A2 (204)	AlB-A2 (204)

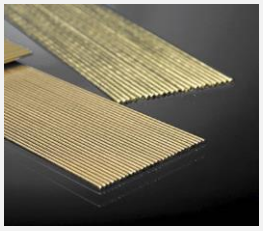
Temperature in parentheses is the recommended preheat and interpass (Celsius) temperature.

Recommended Tungsten Electrodes for GTAW are 2% Thoriated, 2% Ceriated, 2% Lanthanum or E3 (EWG).

Notes: **PHB** = Phosphor Bronze
Deox = Deoxidized Copper
SB = Silicon Bronze
AlB-A2 = Aluminium Bronze A-2
CuNiAl = Copper Nickel Aluminum Bronze
CuNi67 = Copper Nickel 67

Standard Packaging

Packaging

Packaging Type	Image	Diameter	Weight	Remark
Rods		1.2 ~ 9.5 mm		Length: 350 ~ 1000 mm Rod identification possible by stamping. Color for flux coated TIG rods: white, blue, yellow
Spool		0.6 ~ 1.6 m,m	1 ~ 15 kg	Type: D100, D200, D300, K300, BS300
Wood		0.8 ~ 2.4 mm	Max. 250 kg	
Drums		0.8 ~ 1.6 mm	100 ~ 250 kg	
Coils		1.6 ~ 6.0 mm	15 ~ 100 kg	Outer θ : 450 ~ 650 mm Inner θ : 250 ~ 450 mm