

Silicon Bronze

◆ INTRODUCTION

Aufhauser Silicon Bronze is a copper based filler metal containing 3% silicon and small amounts of manganese, tin and zinc. Primarily used for MIG, TIG and oxyacetylene welding of copper, copper-silicon and copper-zinc base metals to themselves and to steel. Excellent for plain or galvanized steel sheet metal as well as other coated steels. The oxyacetylene gas flame should be slightly oxidizing. Keep the weld puddle small in order to promote fast solidification and minimize cracking. A high boric acid flux such as Aufhauser Flux600 should be used both before and during welding. Preheating is NOT recommended.

◆ APPLICATIONS

- MIG, TIG and oxyacetylene welding of copper, copper-silicon and copper-zinc base metals to themselves and to steel.
- Surfacing areas subject to corrosion.

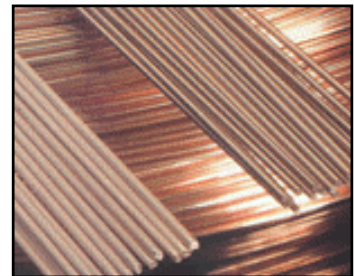
◆ CHEMICAL COMPOSITION

<u>Copper</u>	<u>Zinc</u>	<u>Tin</u>	<u>Manganese</u>	<u>Iron</u>	<u>Silicon</u>	<u>Aluminum</u>	<u>Lead</u>	<u>Others</u>
Remainder	1.0	1.0	1.5	0.50	2.8-4.0	0.01	0.02	0.50

Note: Copper contains Silver. All values are maximum percentage, unless shown in range.

◆ PHYSICAL and MECHANICAL PROPERTIES

Melting Point:	1866°F
Solidification:	1904°F
Density at 68°F:	0.308 lbs./in ³
Electrical Conductivity at 68°F:	7.0 % IASC (annealed)
Thermal Conductivity at 68°F:	21 Btu
Tensile Strength:	50, 000 psi, min.
Elongation, in 2 in.:	65 %
Brinell Hardness:	80-100



◆ SPECIFICATIONS MEET or EXCEED:

- AWS A5.7 ERCuSi-A
- ASME SFA5.7
- QQ-R-571C
- MIL-R-19631B Type MIL-RCuSi-A
- MIL-E-23765/3 (MIL-CuSi)

◆ STANDARD SIZES AND DIAMETERS

<u>Size</u>	<u>Cast</u> <u>(12" spool)</u>	<u>Helix</u> <u>(12" spool)</u>
3/32 or 1/8 x 36" rod	N/A	N/A
.035" dia. X 30 lb. spl	15-40"	< 1"
.045" dia. X 30 lb. spl	15-40"	< 1"
.062" dia x 30 lb. Spl	15-40"	< 1"

Copper and its alloys require a relatively high heat input with shortened welding time. Higher preheat temperatures and faster welding rates than for steel are necessary.



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◆ RECOMMENDED WELDING PARAMETERS:

***GMAW (MIG) Parameters** (DC Reverse Polarity) Electrode Positive Spray transfer

Wire Diameter	Amps	Volts	Argon (cfh)	Wire Feed (ipm)
0.030	130-150	21-23	25	460-500
0.035	145-185	23-25	30	400-440
0.045	195-215	26-28	30	280-310
1/16	260-280	27-30	40	150-210

***GTAW (TIG) Parameters** (DCSP) ² Electrode negative or ACHF

Material	2% Thoriated ²	Filler Wire Size	Amps (DC)	Amps (AC)	Gas Cup	Argon (cfh)
1/16"	1/16"	1/16"	70-150	70-150	3/8-1/2	15
3/32"-1/8"	3/32"	3/32"	150-200	140-230	7/16-1/2	15
3/16"-1/2"	1/8"	3/32"-1/8"	230-400	225-320	7/16-1/2	20
1/2"-1"	3/16"	3/16"-1/4"	325-500	290-485	1/2	25

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