

Deoxidized Copper

◆ INTRODUCTION

Aufhauser C189 is a deoxidized copper filler metal containing 98% copper and small amounts of phosphorus and silicon. The C189 alloy is easy flowing and produces weld deposits that are porosity free, electrically conductive and the color will match that of copper. The oxyacetylene gas flame must be neutral or slightly oxidizing. Tip size must be one to two sizes larger than the base plate. Preheating should be done only if the part is thick. A boric acid or borax flux such as Aufhauser Flux600 is recommended.

◆ APPLICATIONS

- Joining deoxidized copper, electrolytic tough pitch copper and repair weld copper castings with MIG, TIG, and oxyacetylene welding processes.
- Welding galvanized steel and deoxidized copper to mild steel where high strength joints are not required.
- Overlaying steel surfaces to resist corrosion.
- Joining copper pipes, tanks and copper fittings.

◆ CHEMICAL COMPOSITION

<u>Copper</u>	<u>Tin</u>	<u>Manganese</u>	<u>Silicon</u>	<u>Phosphorus</u>	<u>Aluminum</u>	<u>Lead</u>	<u>Others</u>
98.0	1.0	0.50	0.50	0.15	0.01	0.02	0.50

Note: Copper contains Silver. All values are maximum percentage.

◆ PHYSICAL and MECHANICAL PROPERTIES

Melting Point:	1967°F (1075°C)
Density, at 68°F:	0.322 lb/in ³
Electrical Conductivity, at 68°F:	30% IACS
Thermal Conductivity, at 68°F:	75.0 Btu
Electrical Resistivity, at 68°F:	34.6 Ohms-cmil/ft
Specific Gravity:	8.91
Specific Heat Capacity, at 68°F:	0.09 Btu/lb/°F
Tensile Strength:	25,000 psi, min.
Elongation, in 2 in.:	29%
Rockwell F Hardness:	25



◆ SPECIFICATIONS MEET or EXCEED

- AWS A5.7 Class ERCu
- ASME SFA5.7
- QQ-R-571C, MIL-R-19631B Type MIL-RCu-2
- MIL-C-19654 (MIL-RCu-C)

◆ STANDARD SIZES AND DIAMETERS

<u>Size</u>	<u>Cast</u> (12" spool)	<u>Helix</u> (12" spool)
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"	1/8"-1/4"	325-500	290-485	1/2	25

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