

Aluminum Bronze A-1

◆ INTRODUCTION

Aufhauser Aluminum Bronze A-1 is an iron-free aluminum bronze filler metal used for MIG and TIG overlay welding. Aluminum Bronze A-1 is not recommended for joining.

◆ APPLICATIONS

- MIG and TIG overlay welding of wear resistant surfaces exposed to corrosive environments such as salt or brackish water and commonly used acids.
- Overlaying tube sheets, valve seats and refineries in steel and pulp mills.

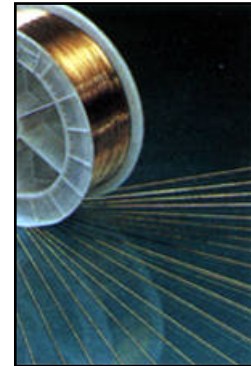
◆ CHEMICAL COMPOSITION

| <u>Copper</u> | <u>Aluminum</u> | <u>Manganese</u> | <u>Zinc</u> | <u>Silicon</u> | <u>Lead</u> |
|---------------|-----------------|------------------|-------------|----------------|-------------|
| Remainder | 6.0-8.5 | 0.50* | 0.20* | 0.10* | 0.02* |

*max (Other) Note: Copper contains Silver. Copper + Named elements = 99.5% min.

◆ PHYSICAL and MECHANICAL PROPERTIES

| | |
|--|---|
| Melting Point: | 1905°F (1041°C) |
| Density, at 68°F: | 0.281 lb/in ³ |
| Electrical Conductivity, at 68°F: | 15 %IACS |
| Thermal Conductivity, at 68°F: | 40.0 Btu · ft/(hr · ft ² · °F) |
| Electrical Resistivity, at 68°F: | 69.2 ohms-cmil/ft |
| Specific Gravity: | 7.78 |
| Specific Heat Capacity, at 68°F: | 0.09 Btu/lb/°F |
| Tensile Strength: | 68,000 psi |
| Yield Strength: | 28,000 psi |
| Elongation, in 2 in.: | 47% |
| Brinell Hardness: | 110-135 |
| <i>Hardness will vary depending on weld quality and welder expertise</i> | |



◆ SPECIFICATIONS MEET or EXCEED

- AWS A5.7 Class ERCuAl-A1
- ASME SFA5.7 ERCuAl-A1
- QQ-C-450
- UNS 61000

◆ 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 |
| 0.035" dia. x 30 lb. spl | 15-40" | < 1" |
| 0.045" dia. x 30 lb. spl | 15-40" | < 1" |
| 0.062" 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 | 70-140 | 25-26 | 25 | 340-450 |
| 0.035 | 130-200 | 26-27 | 30 | 280-400 |
| 0.045 | 185-245 | 27-28 | 30 | 200-300 |
| 1/16 | 250-400 | 28-30 | 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" | 80-120 | 80-120 | 3/8-1/2 | 15 |
| 3/32"-1/8" | 3/32" | 3/32" | 145-205 | 145-195 | 7/16-1/2 | 15 |
| 3/16" | 1/8" | 3/32"-1/8" | 300-350 | 255-300 | 7/16-1/2 | 20 |
| 1/2" | 3/16" | 1/8" | 515-640 | 340-485 | 1/2 | 25 |

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