

Copper-Base Welding Alloys

◆ J.W. Harris Low Fuming Bronze

◆ J.W. Harris Copper Alloys

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J.W. Harris Low Fuming Bronze is manufactured to exact chemistry and melting characteristics by computer controlled technology, assuring you of the finest quality available, worldwide.

J.W. Harris Bronze is a braze welding alloy used to braze steel, steel alloys, and cast iron. It is frequently used to braze steel brackets, straps, angles and related fittings. It is sometimes used to join galvanized sheet of ductwork.

J.W. Harris Bronze requires higher temperature (1620°F) than other brazing alloys and does not flow into the joint by capillary attraction. Instead, the rod is deposited by melting it along the length of the joint. This alloy requires wider joint gaps, fillets, or veegroved butt joints for best results.

A flux is required. Harris bronze brazing flux can be used or rods may be purchased flux coated.

Available in 3/32" or 1/8" bare 36" length rods. Also available flux coated.

Specifications: J.W. Harris Internal Specification

Nominal Composition	
Cu	56.0-60.0
Sn	0.8-1.1
Mn	0.01-0.50
Fe	0.25-1.2
Si	0.04-0.15
Zn	Balance

J.W. Harris Copper Alloys

Amassed knowledge and advanced technology have enabled J.W. Harris to manufacture a broad range of superior quality spooled wires, straight lengths, brazing rods and solder specifically designed to join copper and copper-based alloys.

Some copper and copper alloys may be joined successfully with one or more arc welding processes, while others must be joined by brazing or soldering.

The principle alloying elements in copper alloys are aluminum, nickel, silicon, tin and zinc, each having a specific purpose in enhancement of the resulting alloy. Copper and the copper based alloys are produced either in wrought or cast forms. For welding copper and its alloys, J.W. Harris manufactures deoxidized copper, phosphor bronze, silicon bronze and aluminum bronze. For brazing copper and its alloys, J.W. Harris offers phos/copper, silver/phos/copper, low fuming bronze and nickel bronzes. For soldering, a range of unique wires, pastes and powders are available. All are produced to the most stringent quality standards with particular attention paid to surface conditions, cleanliness, exacting and sliver-free wire diameters and complete traceability from raw materials to finished goods.

Copper-Base Welding Alloys

- ◆ Are cadmium-free, without exception
- ◆ Are available in a wide range of precise wire diameters
- ◆ Are level-layer wound (GMAW wire)
- ◆ Exhibit controlled cast and helix (GMAW wire)
- ◆ Are corrosion-resistant
- ◆ Can join dissimilar metals
- ◆ Conform to AWS specifications (where applicable)
- ◆ Are available with chemical certification, on request
- ◆ Are available flag-tagged, on request

Typical Chemical Analyses of J.W. Harris Copper Alloys

Alloy	AWS Spec	Cu	Zn	Sn	Mn	Fe	Si	P	Al	Pb	Other
Deoxidized Copper	ERCu	98.0 min	-	1.0	0.5	-	0.5	0.15	0.01	0.02	0.5
Silicon Bronze	ERCuSiA	Rem.	1.0	1.0	1.5	0.5	2.8-4.0	-	0.01	0.02	0.5
Phosphor Bronze	Not specified	The only phos/bronze per AWS A5.7 is class ERCuSn-A. J.W. Harris offers ERCuSn-C, which has greater tin content, hardness and strength than ERCuSn-									
Aluminum Bronze A-1	ERCuAL-A1	Rem.	0.2	-	0.5	-	0.1	-	6.0-8.5	0.02	0.5
Aluminum Bronze A-2	ERCuAl-A2	Rem.	0.02	-	-	1.5	0.1	-	0.5-11.0	0.02	0.5

Technical Data: Copper-Based Braze/Welding Alloys (Refer pages 29-31)

Alloy	J.W. Harris Designation	Tensile	Brazing Temperatures	Sizes
Nickel/Silver bare, bead-forming	Welco 14 bare	Up to: 85,000 psi	1690° to 1715°F / 921° to 935°C	3/32" thru 1/4" x 18"
Nickel/Silver flux-coated, bead-forming	Welco 14 flux-coated	Up to: 85,000 psi	1690° to 1715°F / 921° to 935°C	3/32" thru 3/16" x 18"
Low fuming bronze bare	Welco 15 bare	Up to: 65,000 psi	1670° to 1750°F / 910° to 954°C	1/16" thru 3/8" x 36"
Low fuming bronze flux-coated	Welco 15 flux coated	Up to: 65,000 psi	1670° to 1750°F / 910° to 954°C	1/16" thru 1/4" x 36"
Nickel/Silver bare, thin-flowing	Welco 17 bare	Up to: 95,000 psi	1690° to 1715°F / 921° to 935°C	1/16" thru 1/4" x 10"
Nickel/Silver flux-coated, thin flowing	Welco 17 flux-coated	Up to: 95,000 psi	1690° to 1715°F / 921° to 935°C	3/32" thru 3/16" x 10"
Bronze Alloy flux-coated	Welco 40 flux-coated	Up to: 65,000 psi	1590° to 1630°F / 866° to 888°C	3/32" thru 3/16" x 18"
Nickel/Silver bare	Welco 170 bare	Up to: 95,000 psi	1720° to 1800°F / 938° to 982°C	1/16" thru 1/4" x 36"
Nickel/Silver flux-coated	Welco 170 flux-coated	Up to: 95,000 psi	1720° to 1800°F / 938° to 982°C	3/32" thru 1/4" x 36"



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