

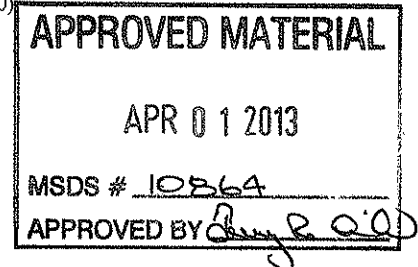


## MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products  
Essentially Similar to U.S. Department of Labor Form OSHA 20  
(to comply with OSHA Hazard Communication Standard 29 CFR 1910.1200)

### SECTION I - PRODUCT IDENTIFICATION

Product Type: **Copper Alloy Wires** (Some wires may be flux coated)  
Classification/Specification: AWS/ASME A5.6/ A5.7/A5.8  
Manufacturer/Supplier Name: UNIBRAZE  
Manufacturer's Address: 1050 Penner Crest Houston TX USA 77055  
Emergency Phone: 713-869-6000 / 1-800-364-6900  
Web Site: www.unibraze.com



### SECTION II - HAZARDOUS INGREDIENTS

The term "Hazardous" in "Hazardous Ingredients" is to be interpreted as a term required and defined in the Hazards Communication.

*This section identifies the materials from which these products are manufactured. The fumes and gases produced during welding with the normal use of this product are covered in SECTION V. Refer to it for industrial hygiene information.*

Product Name	AWS Classification	Cu	Zn	Sn	Mn	Fe	Si	Ni	P	Al	Pb
Unibraze 1400	A5.6 ECuSn-C	Bal.		<8.0	<.01	<.10	<.05	<.05	<.10	<.001	
Unibraze DeOx Copper	A5.7 ERCu	98.0		1.0	0.50		0.50		0.15	0.01	0.02
Unibraze Aluminum Bronze A-1	A5.7 ERCuAl-A1	Bal.	0.20		0.50			0.10		6.0 - 8.5	0.02
Unibraze Aluminum Bronze A-2	A5.7 ERCuAl-A2	Bal.	0.02			.5 - 1.5	0.10			8.5 - 11.0	0.02
Unibraze Aluminum Bronze A-3	A5.7 ERCuAl-A3	Bal.	0.10			2.0 - 4.5	0.10			10.0 - 11.5	0.02
Unibraze Aluminum Bronze A-4	A5.7 ERCuNiAl	Bal.	0.10		.60 - 3.5	3.0 - 5.0	0.10	4.0 - 5.5		8.5 - 9.5	0.02
Unibraze Silicon Bronze	A5.7 ERCuSi-A	Bal.	1.0	1.0	1.5	0.5	2.8 - 4.0			0.01	0.02
Unibraze Phos Bronze C	A5.7 ERCuSn-C	Bal.	0.20	7.0 - 9.0		0.10			.10 - .35	0.01	0.02
Unibraze Low Fuming Bronze	A5.8 RBCuZn-C	56.0 - 60.0	Bal.	.80 - 1.10	.01 - .50	.25 - 1.20	.04 - .15	.20 - .80		0.01	0.05
Unibraze Nickel Silver	A5.8 RBCuZn-D	46.0 - 50.0	Bal.				.04 - .25	9.0 - 11.0	0.25	0.01	0.05
* Naval Bronze	A5.8 RBCuZn-A	59	Bal.	.65							
Manganese Nickel Aluminum Bronze	A5.6 ERCuNiMnAl	Bal.			11.0-14.0	2.0-4.0		1.5-3.0		7.0-8.5	

Flux or other Ingredients	CAS No.	% Of Weight	Exposure Limit (mg/m <sup>3</sup> )	
			OSHA PEL	ACGIH TLV
Copper (Cu) (fume) (4)	7440-50-8	44- 97	.1, 1 (dust)	.2, 1(Dust)
Zinc (Zn) (oxide fume) (2,4)	7440-66-6	0-50	5, 10**	5, 10**
Iron (Fe)	7439-89-6	< 6	10	5.0
Manganese (Mn) (3,4)	7439-96-5	<14	1, 5*, 3.0**	0.2
Nickel (Ni) (4)	7440-02-0	<13	1	1, 1.5
Silicon (Si)	7440-21-3	< 4	15(dust) 5 (Resp)	10, 20 **
Tin (Sn)	7440-31-5	0-9	2	2
Aluminum (Al)	7429-90-5	<12	15	10
Lead (Pb)	7439-92-3	<0.02	.03	.05
Borax Glass, Anhydrous (1)	1303-96-4	2.0	10	1.0

Single values shown are maximum. (1) Flux coating on flux coated rods (2) STEL of 10 mg/m<sup>3</sup>, (3) STEL of 3.0 mg/m<sup>3</sup> .5.0mg/m<sup>3</sup> ceiling (4) Subject to reporting requirements Section 304, 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR 370 & 372  
Short Term Exposure Limit (STEL) Values proposed by OSHA in 1989\* Ceiling Limit \*\*Short Term Exposure Limit (Resp = Respiratory/Respiration

### SECTION III PHYSICAL DATA

Boiling point: 760 mm hg: N.A.      Specific Gravity @ 20c/20C: 8.3 – 8.5 g/cc      Melting point: 1600 – 1900 F  
Appearance and Odor: The products are silver or yellow to red solid at room temperature and exhibit no odor. The metallic rod is insoluble in water. Flux coating is white or blue green. Slightly soluble in water.

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

**Non-flammable.** Welding arc and sparks can ignite combustible and flammable products. See ANSI 49.1 "Safety in Welding & Cutting" (referenced in section VII) for fire prevention and protection information. Never use water as an extinguishing agent around molten metal. Unusual fire and explosion hazards: None but material may react with acids, bases, or oxidizers, material does not present a significant health hazard under normal handling and storage conditions.

### SECTION V REACTIVITY DATA

#### Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of these fumes and gases are dependent upon the metal being welded, the procedures followed and the electrodes used.

Workers should be aware that the composition and quantity of fumes and gases to which they may be exposed, are influenced by: coatings which may be present on the metal being welded (such as paint, plating, or galvanizing), the number of welders in operation and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing procedure). When the electrode is consumed, the fumes and gas decomposition products generated are different in percent and form from the ingredients listed in Section II, The composition of these fumes and gases are the concerning matter and not the composition of the electrode itself. Decomposition products include those originating from the volatilization, reaction, or oxidation of the ingredients shown in Section II, plus those from the base metal, coating and the other factors noted above.

Primary routes of exposure are inhalation of fumes, gases of particulate and ingestion of particulate. Absorption through the skin is not likely. Chronic exposure to copper, zinc and manganese may cause metal fume fever. Symptoms of metal fume fever include fever, dryness of throat, head and body ache, and chill.

Chronic exposure may affect central nervous system leading to emotional disturbances, gait and balance difficulties or paralysis. Overexposure to copper may result in skin and hair discoloration. Nickel has been identified as a potential cancer-causing agent. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One method of determining the composition and quantity of the fumes and gases to which the workers are exposed is to take an air sample from inside the welder's helmet while worn or within the worker's breathing zone. See ANSI/AWS F1.1 publication available from the American Welding Society 550 N.W. LeJeune Road, Miami, Florida 33126.

### SECTION VI HEALTH HAZARD DATA

Electric arc welding may create one of more of the following health hazards

- **Arc Rays** can injure eyes and burn skin Heat Rays (infrared radiation) from hot metal can injure eyes.
- **Electric Shock can Kill.**
- **Noise** can injure hearing.
- **Shielding gases** such as Argon, Helium, & Carbon Dioxide are asphyxiants & adequate ventilation is required.
- **Carcinogenicity:** Chromium, Nickel, Cobalt and their compounds are on the IARC & NPT lists as posing a carcinogenic risk to humans.
- **Fumes & Gases** can be dangerous to your health. Common entry is by inhalation.

**Threshold Limit Value:** The ACGIH recommended general limit for welding fume NOC (Not otherwise classified) is 5mg/m<sup>3</sup> ACGIH1985 preface states: "The TLC-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." See section V for specific fume constituents, which may modify this TLV.

**Effects of Overexposure:** Inhalation of welding fumes and gases can be dangerous to your health. Primary route of entry is by inhalation. Pre-existing medical conditions: individuals with impaired respiratory function may have symptoms worsened by exposure to welding fumes. Short term (acute) over-exposure to zinc vapors when heated form zinc oxide, which inhaled can cause habituation, which you become immune to. Long term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and affect pulmonary function.. These conclusions were drawn from operations different from welding. Regardless, exposure level must be kept below those levels specified in Section II.

**Emergency and First Aid Procedures:** Call for medical assistance. Use first aid procedures recommended by the American Red Cross. If breathing is difficult – give oxygen. If not breathing-use CPR (cardiopulmonary resuscitation). Consult a physician if irritation of the eyes and skin or flash burns develops after exposure.

## SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE OF PRODUCT

Read and understand the manufacturer's instructions and the precautionary label on the product. See ANSI Z-49.1, "*Safety in Welding and Cutting*", published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more details on the following information:

**Ventilation:** Use enough ventilation, local exhaust at the arc, or both to keep exposure within legal limits. In the worker's breathing zone and the general area, the fumes and gases must be kept the TLVs and the *equivalent exposure* must compute to less than one. Train welders to keep their heads out of the fumes.

**Respiratory Protection:** Use respirable fume respirator or air supplier respirator when welding in a confined space or where local exhaust or ventilation does not keep the exposure below TLV. Where respiratory protection is necessary, NIOSH approved respiratory protection should be used. A NIOSH approved Type TC-21-C mask is recommended.

**Eye Protection:** Wear helmet or use face shield with filtered lens. Provides protected screens and flash goggles, if necessary, to protect others. Wear safety glasses or goggles when handling this material to prevent eye contact. Do not wear contact lenses in any environment where dust and fumes are present. Readily available eye wash stations are recommended in areas where operations may produce dust and fumes.

**Protective Clothing:** Wear head, hand and body protection that help prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. At a minimum, welder's gloves and protective face shield and additionally, arm protectors, aprons, hats, shoulder protection as well as dark protective clothing. Train welders not to touch live electrical parts and how to be insulated from work to ground.

**Hygienic Work Practices:** Avoid contact to eyes, skin and mucous membranes. Avoid inhalation of vapors. Wash thoroughly after handling and use. Do not smoke, eat, chew gum or tobacco, or apply cosmetics within the work area. Otherwise follow the standards of good industrial hygiene practices.

**Waste Disposal Method:** Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with Local, State and Federal Regulations.

**Procedure for Cleanup of Spills or Leaks:** NOT APPLICABLE.

## SECTION VIII – OTHER INFORMATION

NFPA CODES:    FIRE – 0            HEALTH – 2            REACTIVITY - 0

*Unibrazz believes that information set forth in this Material Safety Data Sheet is accurate.*

*Unibrazz makes no warranty, expressed or implied, with respect thereto and disclaims any liability from reliance therein.*