



MATERIAL SAFETY DATA SHEET

COPPER BASED WELDING AND BRAZE WELDING WIRE AND ROD

SECTION 1 - MATERIAL IDENTIFICATION

Manufacturers Name J. W. Harris Co., Inc.

Distributor Name (If Applicable) _____

Address 10930 Deerfield Road

Address Cincinnati, Ohio 45242

Emergency Telephone (513) 891-2000

MSDS Date November 1985

The following table lists the trade name and composition of products covered by this Material Safety Data Sheet. See Section 2 and especially Section 6 for important health hazard data.

Trade Name	Bare Rod or Wire								
	Chemical Composition (%)								
	Cu	Zn	Sn	Al	Mn	Fe	Si	Ni	P
Naval Bronze	57-61	Balance	0.25-1.00						
Nickel Bronze	56-60	Balance	0.8-1.1		0.01-0.50	0.25-1.2	0.04-0.15	0.2-0.8	
Harris American Low Fuming Bronze ①	56-60	Balance	0.8-1.1		0.01-0.50	0.25-1.2	0.04-0.15		
Nickel Silver	46-50	Balance					0.04-0.25	9.0-11.0	
Alloy 670	Balance					0.40-0.75		29.0-32.0	
Aluminum Bronze 40	Balance			7.0-8.0	11.0-14.0	2-4.0		1.5-3.0	
Nickel Aluminum Bronze 46	Balance			8.5-9.5	0.6-3.5	3.0-5.0		4.0-5.5	
Aluminum Bronze A3	Balance			10.0-11.0		3.0-5.0			
Aluminum Bronze A1	Balance	0.10		6.0-8.5	0.50		0.10		
Aluminum Bronze A2	Balance	0.02		8.5-11		1.5	0.10		
De-Ox Copper	98.0 min		1.0		0.5		0.5		0.15
Silicon Bronze	94 min.	1.5	1.5		1.5	0.5	2.8-4.0		
Phos Bronze A	93.5 min.		4.0-6.0						0.10-0.35
Phos Bronze C	Balance		7.0-9.0						0.05-0.35

Flux Coating (% of coating weight)

Boric Acid Over 50

Sodium Tetraborate Over 10

Other _____

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SECTION 2 - HAZARDOUS MATERIALS

Welding rod or wire is a nonhazardous solid at ambient temperature. Hazards (as defined by OSHA 29CFR 1910.1200) may result from fume generated during welding or brazing. Section 1 lists product designations and composition as manufactured. **IMPORTANT - See Section 6 for information on potential fume hazard resulting from use of the product.**

SECTION 3 - PHYSICAL DATA

Solid wire or rod. Rods may be coated with a chemical flux. Flux coating may be white or other colors.

SECTION 4 - FIRE AND EXPLOSION DATA

(Nonflammable) Welding arc, open flame and sparks can ignite combustibles. See ANSI/ASC Z49.1-1983 Section 6.

SECTION 5 - HEALTH HAZARD DATA - COPPER BASED WELDING AND BRAZE WELDING ALLOYS

Exposure - Section 1 lists normal composition of copper based filler metals. Section 6 lists exposure limits for hazardous decomposition products which might be present in fume generated during welding or brazing. Actual exposure should be determined by monitoring fume in the operator's breathing zone.

Primary Route of Exposure - Inhalation of fume.

Pre-existing medical conditions - Individuals with impaired pulmonary functions or illness may have symptoms exacerbated by fume irritants.

Possible Effects of Exposure - Copper and zinc fume may cause metal fume fever. Short term symptoms may include a metallic taste in the mouth, dryness or irritation of the throat followed by coughing, shortness of breath, nausea, fever, body ache, and chills. Long term exposure to welding fume, gases or dust may contribute to pulmonary irritation or pneumoconiosis. Nickel should be considered a possible carcinogen per OSHA 29 CFR 1910.1200. Certain nickel compounds have been implicated based on experience in some nickel refining operations. The specific compounds, however, have not been determined and a direct association between nickel in welding fume and cancer has not been demonstrated.

Emergency First Aid - Remove from dust or fume exposure. If breathing has stopped, perform artificial respiration. Summon medical aid immediately.

Other Health Considerations -

Arc Rays from electric arc welding operations can injure eyes and burn skin.

Electric Shock - From arc welding equipment can kill.

Heat Rays - (Infrared radiation from flame or hot metal) can injure eyes.

SECTION 6 - REACTIVITY DATA

Hazardous Decomposition Products

Welding and brazing fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being brazed or welded, the process, procedures, and filler metals used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the operator'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 activities). When the filler metal is consumed, the fume and gas decomposition products generated are different in percent and form from the solid wire or rod ingredients listed in Section 1. Fume and gas decomposition products, and not the ingredients in the electrode or wire are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. Also, new compounds not in the electrode or wire may form. Decomposition products of normal operation include those originating from the base metal and coating, etc., as noted above.

Section 1 lists composition of the aluminum wire or rod. The chart below lists those constituents, defined as hazardous, which are likely to be present in the welding fume.

Element	CAS#	PEL mg/m ³ (1)	TLV mg/m ³ (2)
Copper (fume)	7440-50-8	0.1	0.2
Zinc (oxide)	1314-13-2	5.0	5.0 (fume)
Tin (oxide)	7440-31-5	2.0	2.0
Aluminum (welding fume)	7429-90-5	Not Listed	5.0
Manganese	7439-96-5	5.0 (ceiling)	1.0 (fume)
Iron (oxide fume)	1309-37-1	10.0	5.0
Silicon (SiO ₂ , amorphous, respirable)	60676-76-86-0	Not Listed	5mg/m ³ respirable dust 10 mg/m ³ total dust
Nickel (soluble compounds)	7440-02-0	1.0	0.1

Some of these products are coated with a chemical flux. For flux coated rod the following should be included with the above bare rod fume constituent.

Element	CAS#	PEL	TLV
Boric Acid (Boron Oxide)	1303-86-2	15.0	10.0
Sodium tetraborate	1303-96-4	Not Listed	1.0

(1) Permissible exposure limit OSHA 29CFR 1910.1000 Subpart Z

(2) Threshold limit value American Conference of Government Industrial Hygienists

Gaseous reaction products such as carbon monoxide and carbon dioxide, ozone and nitrogen oxides may be formed by the radiation from the arc during electric arc welding.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 available from the American Welding Society, P. O. Box 351040, Miami, Florida 33135.

SECTION 7 - SPILL OR LEAK PROCEDURES

NOT APPLICABLE

SECTION 8 AND 9 - SPECIAL PROTECTION INFORMATION AND PRECAUTIONS

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, *Safety in Welding and Cutting* published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more detail on many of the following.

Ventilation

Use enough ventilation, local exhaust at the arc (or flame), or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the employee to keep his head out of the fumes. See ANSI/ASC Z49.1 Section 5.

Respiratory Protection

Use respirable fume respirator or air supplied respirator when welding, brazing, or soldering in confined space or where local exhaust or ventilation does not keep exposure below TLV.

Eye Protection

Wear helmet or use face shield with filter lens of appropriate shade number (see ANSI/ASC Z49.1 - Section 4.2). Provide protection screens and flash goggles, if necessary, to shield others.

Protective Clothing

Use head and body protection which help to prevent injury from radiation, sparks, flame, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the employee not to touch live electrical parts and to insulate himself from work and ground.

The information and recommendations contained in this publication have been compiled from sources believed to be reliable and to represent the best information on the subject at the time of issue. No warranty, guarantee, or representation is made by Unibrazo Corp. or J.W. Harris Co., Inc. as to the absolute correctness or sufficiency of any representation contained in this and other publications; Unibrazo Corp. and J.W. Harris Co., Inc. assume no responsibility in connection therewith; nor can it be assumed that all acceptable safety measures are contained in this (and other publications), or that other or additional measures may not be required under particular or exceptional conditions or circumstances.



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