MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet (MSDS) complies with the requirements of OSHA's Hazard Communication Standard.

BARE and/or FLUX-COATED BRONZE

RADNOR WELDING PRODUCTS

Emergency Phone Number: 866-734-3438

Date: April 30, 2006

Product Information Number: 888-838-0615

SECTION 1 – PRODUCT IDENTIFICATION

Product Name/Class	Bare Bronze/Flux-Coated Bronze
Product Number	004015
Manufacturer	Radnor Welding Products 259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283

SECTION 2 – HAZARDOUS INGREDIENTS

Material	CAS Number	% By Weight	ACGIH TLV	SARA Sec 313 Reporting
Bare Bronze Only				
Copper	7440-50-8	58.0 – 60.0	.2 MG/M^3	Yes
Iron	7439-89-6	.25 - .50	5 MG/M^3 Fe203 Fe	N/A
Tin	7440-31-5	0.50 – 1.0	2 MG/M^3	N/A
Zinc	7440-66-6	Balance	(approx.) 5 MG/M^3	Yes
Manganese	7439-96-5	0.10 – 0.25	NIC-0.2	Yes
Silicon	7440-21-3	0.12 – 0.30	10	N/A
Flux Coated Bronze Only				
Boric Acid	10043-35-3	5.0	5 MG/MG^3 (NOC)	N/A
Borax Glass	1303-96-4	2.0	1 MG/M^3	N/A
Copper	7440-50-8	58 – 60.0	.2 MG/M^3	Yes
Iron	7439-89-6	0.25 – 0.50	5 MG/M^3 Fe203 Fe	Yes
Tin	7440-31-5	0.50 – 1.0	2 MG/M^3	N/A
Zinc	7440-66-6	Balance	(approx.) 5 MG/M^3	Yes
Manganese	7439-96-5	0.10 – 0.25	NIC-0.2	Yes
Silicon	7440-21-3	0.12 – 0.30	10	N/A

SECTION 3 – PHYSICAL CHARACTERISTICS

Boiling Point: N/A	Specific Gravity (H_2O = 1): 8.3 – 8.5 G/CC	Solubility in Water : N/A
Vapor Pressure (mm Hg): N/A	Melting Point: 1600 – 1900° F.	%Volatile: N/A
Vapor Density (Air = 1): N/A	Evaporation Rate (Butyl Acetate=1): N/A	Appearance and Odor: Bare or Coated Bronze Rod. No odor.

SECTION 4 – FIRE and EXPLOSION HAZARD DATA

Flash Point (Method Used): N/A	Flammable Limits:	LEL: N/A
		UEL: N/A

Extinguishing Media: Never use water as an extinguishing agent around molten metal. Water will react violently around any molten metal. Use dry chemical, CO_2 or sand.

Special Fire Fighting Procedures: Non Flammable. Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1 for fire prevention during the use of welding and allied procedures.

Unusual Fire and Explosion Hazards: N/A

SECTION 5 – REACTIVITY DATA

Stability	Unstable ☐	Conditions to Avoid: N/A
	Stable ☒	

Incompatibility (Materials to Avoid): N/A

Hazardous Decomposition or Byproducts: N/A

Hazardous Polymerization	May Occur ☐	Conditions to Avoid: N/A
	Will Not Occur ☒	

SECTION 6 – HEALTH HAZARD DATA

Routes of Entry: ☒ Inhalation ☒ Skin ☒ Ingestion

Health Hazards (Acute and Chronic): Chronic exposure to: Manganese, Copper & Zinc may cause metal fume fever. Symptoms include: fever, fatigue, head & body ache, dryness of the throat, and chill. Chronic exposures may affect the central nervous system leading to emotional disturbance, gait, balance difficulties, & paralysis. Copper overexposure – may cause skin & hair discoloration.

Carcinogenicity: No ingredients listed are considered as possible carcinogens under OSHA (29 CFR 1910.1200), however, the composition of welding or brazing fumes may contain carcinogens, depending on several factors that are unknown and unknowable to the product manufacturer (see Section 5). Always assume that welding or brazing fumes may contain toxic and/or carcinogenic materials, and follow sound Work/Hygiene practices as recommended by ANSI Z49.1.

Signs and Symptoms of Exposure: Brazing operations may create one or more of the following health hazards:
Fumes and Gases can be dangerous to your health. Common entry is by inhalation. Other possible routes are skin contact and ingestion. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Long-term (chronic) overexposure to brazing fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function. Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. Bronchitis and some lung fibrosis have been reported.

Medical Conditions Generally Aggravated by Exposure: May aggravate pre-existing respiratory problems (e.g. asthma, emphysema).

Emergency and First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT give oxygen. IF NOT BREATHING employ CPR (Cardiopulmonary Resuscitation) techniques.

HMIS Rating	HMIS Scale	NFPA Rating	NFPA Scale
Health = 2 Flammability = 0 Reactivity = 0	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard	Health = 1 Flammability = 0 Reactivity = 0 Other = N/A	4 = Severe Hazard 3 = Serious Hazard 2 = Moderate Hazard 1 = Slight Hazard 0 = Minimal Hazard

SECTION 7 – PRECAUTIONS for SAFE HANDLING and USE

Steps to Be Taken in Case Material Is Released or Spilled: Product is non-hazardous in terms of potential environmental harm. No special precautions are required for spills of bulk material. Scrap metal can be reclaimed for reuse. Follow federal, state, and local regulations regarding disposal.

Waste Disposal Method: Discard any product residue, disposable container, or liner in an environmentally acceptable manner.

Precautions to Be Taken In Handling and Storing: Handle only during welding and brazing. See Section 8.

SECTION 8 – CONTROL MEASURES

Respiratory Protection *(Specify Type)*: Should be used in accordance with 29 CFR 1910.34. If exposure is above the PEL or TLV – NIOSH approved respirator for fume and dust. The ACGIH recommended general limit for Welding Fume NOC – (Not otherwise Classified) is 5 mg/m^3. ACGIH-1987-88 preface states that the TLV-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 5 for specific fume constituents which may modify this TLV. Threshold Limit Values are figures published by the American Conference of Government Industrial Hygienists. Units are milligrams per cubic meter of air.

Ventilation: Local mechanical exhaust recommended during all welding or brazing operations.

Protective Gloves: Required during welding or handling.

Eye Protection: Always wear eye protection during welding or brazing operations, helmet and/or face shield with filter lens recommended.

Other Protective Clothing or Equipment: Welding may produce fumes & gases hazardous to health, avoid breathing these fumes and/or gases. Protective clothing required against burns. See latest NIOSH Requirements and National Standard Z49.1.

Work/Hygienic Practices: Wash hands thoroughly after use, and before eating, drinking, smoking, applying cosmetics or contact lenses. Wet material should never be charged into a molten bath. Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information. ANSI Z49.1, The American Welding Society, P.O. Box 351040, Miami, FL 33135, OSHA (29CFR 1910) U.S. Department of Labor, Washington, D.C. 20210.

OTHER INFORMATION REQUIRED BY STATE OR FEDERAL LAW

California Proposition 65 Information: Warning: This product contains a chemical known to the State of California to cause cancer.

New Jersey Right-To-Know Information: 5 most predominant ingredients/hazardous and non-hazardous)
Bare Bronze: 1. Copper; 2. Zinc; 3. Tin; 4. Iron; 5. Silicon
Flux Coated Bronze: 1. Copper; 2. Zinc; 3. Boric Acid; 4. Boric Glass; 5. Tin.

SARA Title III Notification Information: All chemical compounds marked with an asterisk (*) are toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Super Fund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Disclaimer of Expressed and Implied Warranties: The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from the use of this information or the product, the safety of this product, or the hazards related to its use.