

Material Safety Data Sheet
 (Essentially Similar to U.S. Department of Labor
 Suggested Form For Hazard Communication Compliance)

I. Product Identification



Product Type - COPPER BASED BRAZING ALLOYS
 EMERGENCY NUMBER (CHEMTREC) 1-800-424-9300

APPROXIMATE COMPOSITION (Wt. %)

<u>Product Trade Name</u>	<u>Borax</u>	<u>Boric Acid</u>	<u>Proprietary</u> Methacrylate/ Aliphatic and Naphthenic Hydrocarbon Compound	<u>Cu</u>	<u>Fe</u>	<u>Mn</u>	<u>Si</u>	<u>Sn</u>	<u>Zn</u>
Low Fuming Bronze ❶	-	--	--	55-60	<1	<0.5	<0.5	0.3-1.5	38-42
Low Fuming Bronze Flux Coated ❶	0.5-2.5	3-6	<1	50-60	<1	<0.4	<0.5	0.3-1.5	35-40

❶ See Note in Section VI

Weldcote Metals requests the users of these products to study this Material Safety Data Sheet (MSDS) and the product labels and become fully aware of the product hazards and safety information. To promote the safe use of these products a user should (1) notify and train its employees, agents and contractors concerning the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for these products, and (3) request that such customers notify and train their employees and customers, for these products, of the same product hazards and safety information.

II. Hazardous Ingredients

IMPORTANT: This section covers the materials from which this product is manufactured. The fumes and gases produced during normal use of these products are covered in Section V. The term HAZARDOUS should be interpreted as a term required and defined by Laws, Statutes or Regulations, and does not necessarily imply the existence of any hazard when the products are used as directed by Weldcote Metals.

Material	(CAS No.)	SARA	ACGIH TLV		OSHA. PEL)	
			TWA (mg/m3)	STEL (mg/m3)	TWA (mg/m3)	STEL (mg/m3)
Borax Glass (B.H2072Na)	(1330-43-4)		1		5 (Respirable Fraction)	--
Boric Acid (H3803)	(10043-35-3)		Not listed 10 (for 8203)		Not Listed 5 (for 8203 - Respirable)	--
Copper (Cu)	(7440-50-8)	*	0.2 (Fume)		0.1 (Fume)	--
Iron (Fe)	(7439-89-6)		5 (Oxide Fume)		1 0 (Total Particulate)	--
Manganese (Mn)	(7439-96-5)	*	0.2 (Fume)		1 (Fume)	3
Silicon (Si)	(7440-21-3)		10 (Dust)		5 (Respirable)	--
Tin (Sn)	(7440-31-5)		2		2	--
Zinc (Zn)	(7440-66-6)	*	2 (Oxide Respirable) 10 (STEL) (Oxide Respirable)		5 (Oxide Fume)	10
Proprietary Methacrylate/Apliphatic and Naphthenic Hydrocarbon Compound			Not established		Not established	--

NOTE: In the ingredients table, an asterisk (*) after the CAS number indicates a toxic chemical subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (SARA) and 40 CFR Part 372.

III. Physical Data

As shipped, these products are nonflammable, nonexplosive, nonreactive, and nonhazardous

Physical State: Gas () Liquid () Solid (X)

Melting Point: 1600 - 1900°F

Solubility in Water: Metal rod is insoluble; flux coating is slightly soluble

Specific Gravity (H2O = 8.3-8.5)

Odor and Appearance: Bare or flux coated bronze colored metal wire. Odorless.

IV. Fire & Explosion Hazard

Flammable/Explosive NO (X) YES ()

Under What Conditions: _Only the packaging for this product will burn.

Extinguishing Media: This product will not burn; however, welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 "Safety in Welding and Cutting" and "Safe Practices" Code: SP, published by the American Welding Society, P. O. Box 351040, Miami, FL 33135, and NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269 for additional fire prevention and protection information.

Special Fire Fighting Procedures: Full protective equipment required. When involved in a fire, these products may emit toxic and irritating fumes of the metals and of sodium oxide. When molten, these products are a significant thermal hazard to firefighters.

V. Reactivity Data

Stability: Stable (X) Unstable () Polymerization will not occur.

Incompatibility (Materials to Avoid): Strong acids, strong oxidizers, some halogenated compounds.

Conditions to avoid: Uncontrolled exposure to extreme temperatures.

Hazardous Decomposition Products: Brazing fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the material being worked, the process, procedures and consumables 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 material being worked (such as paint, plating or galvanizing), the number of welding operations and the volume of the work area, the quality and amount of ventilation, the position of the workers head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning or painting activities). When the materials are consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the ingredients, plus those from the material being worked and the coatings etc. noted above.

Reasonably expected decomposition products from normal use of these products include a complex of the oxides of the materials listed in Section II, as well as carbon monoxide, carbon dioxide, ozone and nitrogen oxides (refer to "Characterization of Arc Welding Fume" available from the American Welding Society). THE GENERAL LIMIT FOR WELDING FUMES is 5 mg/m3. The TLV for some of the hazardous airborne ingredients listed in Section II may be exceeded before the general TLV for welding fumes. THE FUME LIMIT FOR COPPER AND MANGANESE MAY BE REACHED BEFORE THE GENERAL LIMIT FOR WELDING FUMES. MONITOR FUMES FOR COPPER AND MANGANESE. The only way to determine the true identity of the decomposition products is by sampling and analysis. The composition and quantity of the fumes and gases to which a worker may be overexposed can be determined from a sample obtained from inside the welder's helmet, if worn, or in the workers breathing zone. See ANSI/AWS F1.5 "Methods for Sampling and Analyzing Gases from Welding and Allied Processes" and ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes," available from the American Welding Society.

Possible hazards durina processina bv solderina. brazina. braze weldina. weldina or arc spray metallizina

	<u>ACGIH TLV</u>	<u>OSHA PEL</u>
Ozone	0.1 ppm (ceiling)	.0.1 ppm
Nitric oxide	25 ppm	25 ppm
Nitrogen dioxide	3, 5ppm (STEL) 5	5 ppm (ceiling)
Welding fumes	mg/m3	
Carbon monoxide	25 ppm	50 ppm

VI. Physical and Health Hazard Data

WARNING: Welding, brazing, braze welding, soldering and cutting may create one or more of the following health or physical hazards. Fumes and gases can be dangerous to your health. Electric shock can kill you. Arc rays can injure eyes and burn skin. Heat rays (infrared radiation) from flame or hot metal can injure eyes. Noise can damage hearing. Brazing alloys are frequently used with a fluoride type flux. Fumes and gases containing fluoride burn eyes and skin on contact and can be fatal if swallowed. See ANSI Z49.1 "Safety in Welding, Cutting, and Allied Processes" available from the American Welding Society.

Potential Health Effects: Direct contact with the product causes irritation of the eyes and continuous contact may cause skin irritation. Prolonged or repeated skin overexposure to the coating can be irritating and lead to allergic contact dermatitis. Excessive levels of airborne coating dust may irritate the mucous membranes and upper respiratory tract.

Route of overexposure: The primary route of entry of the decomposition products is by inhalation. Skin contact, eye contact, and ingestion are possible. Absorption by skin contact is unlikely. When these products are used as recommended by Weldcote Metals, and ventilation maintains exposure to the decomposition products below the limits recommended in this section, overexposure is unlikely.

Effects of acute (short-term) overexposure to the gases, fumes and dusts may include irritation of the eyes, lungs, nose and throat. Some toxic gases associated with welding may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty in breathing, frequent coughing, or chest pain. The presence of copper and zinc in fume can 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. Excessive inhalation of zinc oxide fume may produce symptoms known as zinc shakes, an acute self limiting condition without recognized complications. Symptoms usually disappear within 24 hours.

Pre-existing Medical Conditions Aggravated by Overexposure: Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to brazing fumes; however, such reaction cannot be predicted due to the variation in composition and quantity of the decomposition products.

Effects of chronic (long-term) overexposure to air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest X-rays. The severity of the change is proportional to the length of the exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on X-rays may be caused by non-work factors such as smoking, etc. Long term exposure to brazing fume, gases, or dust may contribute to pulmonary irritation or pneumoconiosis. Prolonged absorption of boric acid in high doses may cause nausea, vomiting and diarrhea with delayed effects of skin redness and peeling. Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances, and spastic gait. The effect of manganese on the nervous system is irreversible. Overexposure to copper fumes may lead to copper poisoning, resulting in hemolytic anemia and liver, kidney and spleen damage. Inhalation of too much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung can be seen on a chest x-ray but causes little or no disability

Exposure limits for the ingredients are listed in Section II. The ACGIH and the 1989 OSHA TWA for welding fume is 5 mg/m³. At time the limit for a particular hazardous chemical is reached before the limit for welding fumes. TL V- TWA's should be used as a guide in the control of health hazards and not as firm lines between safe and excessive concentrations. As noted in Section V, the fume from welding and allied processes is a mixture of many components. Therefore, a statutory computation of the *equivalent exposure* is required. The *equivalent exposure* value for the welding and brazing fume mixture shall always be less than one. When these products are used as recommended by Weldcote Metals, and the preventive measures taught in this MSDS are followed, overexposure to hazardous substances will not occur.

Emergency First Aid Measures: In case of emergency, call for medical aid. Employ first aid technique recommended by the Red Cross. IF BREATHING IS DIFFICULT, give oxygen and call for a physician. If breathing has stopped, perform artificial respiration. Summon medical aid immediately. FOR ARC BURN, apply cold, clean compresses and call a physician.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes to remove all residue. Seek medical attention.

Skin Contact: Promptly flush with water for at least 15 minutes to remove all residue. If rash develops, consult a physician.

Inhalation: Remove to fresh air. Obtain medical assistance immediately; advise physicians of ingredients listed in Section II. If breathing has stopped, perform artificial respiration. Administer oxygen if available.

Ingestion: Call a physician or your Poison Control Center. Advise of Section II.

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, Other): This product contains no chemicals found in the cited references. Sax's Dangerous Properties of Industrial Materials lists Tin as a "questionable carcinogen with experimental tumorigenic data by implant route.

● **Warning:** This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code §25249.5 et seq.)

VII. Precautions for Safe Handling and Use/Applicable Control Measures

Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard 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 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 for more detail on many of the following:

Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in confined spaces or where local exhaust or ventilation does not keep exposure below the TLVs. Where respiratory protection is necessary, NIOSH approved respiratory protection should be used.

Eye Protection: Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protective screens and flash goggles, if necessary, to shield others. Wear safety glasses or goggles when handling this material to prevent eye contact. Do not wear contact lenses in any environment where dust or fumes are present. Readily available eye baths are recommended in areas where operations may produce fumes and dusts.

Ventilation: Use enough ventilation, local exhaust at the source, or both, to keep the exposure within legal limits. In the worker's breathing zone and the general area, the fumes and gases must be kept below the TL Vs and the *equivalent exposure* must compute to less than one. Train the operator to keep his head out the fumes.

Protective Clothing and Equipment: Wear head, hand, and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. 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 welder not to touch live electrical parts and to insulate himself from work and 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, drink, chew gum or tobacco, or apply cosmetics within the working area. Do not carry or store tobacco products, gum, food, drinks or cosmetics in the working area. Otherwise follow the standards of good industrial hygiene practices.

Procedure for Cleanup of Spills or Leaks: Recyclable/solid. Vacuuming recommended for accumulated dusts. Conform with Federal, State, local and OSHA regulatory statutes.

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

The opinions expressed in this MSDS are those of qualified experts within **Weldcote Metals**. We believe that the information contained herein is current as of the date of this MSDS. Since the use of this information and these opinions and the conditions of use of these products are not within the control of **Weldcote Metals**. It is the user's obligation to determine the conditions of safe use of these products.

Weldcote Metals believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Weldcote Metals can not make any expressed or implied warranty as to this information.