



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 Identification

Manufacturer/Supplier Name: UNIBRAZE CORP.
Address: 1050 PENNER CREST, HOUSTON, TX 77055
Emergency Phone: (713) 869-6000, 1-800-364-6900

Classifications: ERTi-1, ERTi-2, ERTi-3, ERTi-4, ERTi-5, ERTi-5ELI, ERTi-6, ERTi-7, ERTi-9, ERTi-9ELI, ERTi-12, ERTi-15

Specifications: AWS A5.16

SECTION II HAZARDOUS INGREDIENTS/Identity Information

IMPORTANT: This section covers the materials for which the product was manufactured. The fumes and gases produced during welding with the normal use of this product are covered.

*The term "Hazardous Materials" should be interpreted as a term required and defined in OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200); however, the use of this term does not necessarily imply the existence of any hazard.

Flux or other Ingredients	% Of Weight	CAS No.	Exposure Limit (mg/m ³)	
			OSHA PEL	ACGIH TLV
Aluminum (Al) ^{a, c}	< 6.7	7249-90-5	15 T/ 5 R/ 5 F	5 R / 10 T
Molybdenum (Mo) ^a	< 1.5	7439-98-7	5 / 15 T	5 / 15
Nickel (Ni) ^c	< 0.9	7440-02-0	.015	1
Tantalum (Ta) ^a	<. 01	7440-25-7	5	5
Chromium (Cr) ^c	< 11.0	7440-47-3	.01 (as Cr VI)	0.05 (as Cr VI)
Tin (Sn)	< 3.0	7440-31-5	2	2
Iron (Fe) ^a	.01 - .05	7439-89-6	5 OF	10 T
Vanadium (V) ^a	< 4.5	7440-62-2	.5 T, F	.5 T, F
Titanium (Ti)	Balance	7440-32-6	NE	NE

^a =Exposure limits for oxides, dust, fume and mists where applicable F=Fume R= Respirable fraction T= Total dust OF= Oxide Fume * =Ceilinglimit

^c = "WARNING: This product contains or produces a chemical known to the State of California to cause cancer or birth defects (or other reproductive harm). (California Health and Safety Code § 25249.5 et seq.)" NE= Not Established

SECTION III PHYSICAL DATA

Welding consumables applicable to this sheet as shipped, consist of odorless, solid rods or wire, which have a metallic luster. As shipped, these products are nonflammable, non-explosive, non-reactive, and non-hazardous.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

These items are not reactive, flammable, or explosive and essentially not hazardous at ambient temperatures. Welding arcs and sparks can ignite combustibles and flammable products. If involved in a fire, these products may generate irritating aluminum fumes and a variety of metal oxides. Emergency responders must wear personal protection equipment suitable for the situation. 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 "Cutting and Welding Processes," published by the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269 for additional fire prevention and protection information.

SECTION V HEALTH HAZARD DATA

Welding fumes and gases can be dangerous to your health. Electric shock can kill you. Arc rays can injure eyes and burn skin. Noise can damage hearing.

Route of overexposure: The primary route of entry of the decomposition products is by inhalation. Skin contact, eye contact, and ingestion are possible.

Effects of Acute (Short-Term) Overexposure: Short-term (acute) 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 chromium/chromate in fume can cause irritation of nasal membranes and skin. The presence of nickel compounds in fume can cause metallic taste, nausea, tightness of chest, fever, and allergic reaction.

Pre-existing Medical Conditions Aggravated by Overexposure: Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to welding fumes.

Effects of Chronic (Long-Term) Overexposure: Long-term (Chronic) 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 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. Nickel and chromium are considered carcinogenic. Long term overexposure to nickel fumes may also cause pulmonary fibrosis and edema. Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances, and spastic gait.

Carcinogenic Assessment (NTP Annual Report, IARC Monographs, Other): Nickel and Chromium must be considered possible carcinogens under OSHA (29CFR1910.1200). IARC has indicated Nickel, Chromium and certain of their compounds are probably carcinogenic for humans. Exposure levels must be kept below those levels specified in Section II.

Warning: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health and Safety Code § 25249.5 et seq.)

SECTION IV REACTIVITY DATA

Hazardous Decomposition Products: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and welding consumables used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coating on the metal being welded (i.e. paint, painting, galvanizing), the number of welders, the volume of the work area, the quality and the amount of ventilation, the position of the welders head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from the cleaning and degreasing activities). When an electrode is consumed, the fume and gas decomposition products generated are different in percent and form

from the ingredients listed in Section II. Fume and gas decomposition, and not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration. Also, new compounds not in the electrodes may form. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the materials shown in Section II, plus those from the base metal coating, etc., as noted above. *Most welding, even with primitive ventilation, does not produce exposures within the welding helmet above 5mg/m³. That which does should be controlled.*

SECTION VII SPILL OR LEAK PROCEDURE

This product is not hazardous per 49 CFR 172.101 by the U.S. Department of Transportation.

SECTION VIII SPECIAL PROTECTION INFORMATION

Ventilation: Use enough ventilation, local exhaust at the arc (or flame), or both, to keep the fumes and gases below the PEL's, TLV's and STEL's in the workers breathing zone and 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 a confined space or where local exhaust or ventilation does not keep exposure within limits outlined in Section II.

Eye Protection: Arc Rays can injure your eyes. Wear helmet or face shield with filter lens of appropriate shade number. See ANSI/ASC Z49.1 Section 4.2. Provide protective screens and flash goggles, if necessary, to shield others.

Protective Clothing: Wear 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 him/herself from work and ground. Welders should not wear short sleeve shirts or short pants.

Waste Disposal Method: Prevent waste for contamination surrounding environment. Discard any product or residue in a disposable container or liner in an environmentally approved manner under full compliance with federal, state and local regulations.

Emergency First Aid: Remove from dust or fume exposure immediately and seek medical attention. If breathing has stopped perform artificial respiration and summon emergency medical aid.

For other precautions or additional safety information on welding and cutting, see American Standard Z49.1-1980, *Safety in Welding and Cutting*, and the *Welding Handbook*, Volume 1, Chapter 9, Safe Practices in Welding and Cutting. Both available from the American Welding Society, Inc. 550 N.W. Le Jeune Road, P.O. Box 351040, Miami, FL 33135.

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

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