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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

Supplier Name: Weld Wire Company, Inc.

Address: 103 Queens Drive, King of Prussia, Pa. 19406

Phone: (610)265-3555 (800)523-1266 Fax: (610)265-7806

Classifications: E308T-1/-4, E308LT-1/-4, E309T-1/-4, E309LT-1, E309LMoT-1/-4,

E316T-1, E316LT-1/-4, E317LT-1/-4, E347T-1/-4, E410T-1/-4, E410NiMoT-1/-4

Specification: AWS A5.22

SECTION II: HAZARDOUS INGREDIENTS/Identity Information

IMPORTANT: This section covers the materials from which the product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered under Section V.

*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	% Weight	CAS No.	Exposure Limit (mg/m3)	
OSHA PEL			ACGIH TLV	
Iron (Fe)	60-70	7439-89-6	5	Not reported
Manganese (Mn)	Less than 3	7439-96-5	5*	5*
Nickel (Ni)	2-8	7440-02-0	1	1
Molybdenum (Mo) A	Less than 5	7439-98-7	15 (Mo)	10 (Mo), 20**
Chromium (Cr)	4-12	7440-47-3	1	0.5
Silicon (Si)	Less than 3	7440-21-3	Nothing found	10, 20**
Titanium Oxide	3-7	13463-67-7	15	10, 20**
Zirconium (Zr)	Less than 4	7440-67-2	5	5

Occupational Safety and Health Administration 29 CFR 1910.1000 Permissible Exposure Limit (PEL). American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV[R]). *Ceiling Limit **Short Term Exposure Limit
(A) In 316T-1, 316LT-1 and 317LT-1

SECTION III: PHYSICAL DATA

NOT APPLICABLE

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

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.

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for welding fume NOC (Not otherwise classified) is 5 mg/m³. ACGIH-1985 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.

Common Entry Is by Inhalation or Through the Eyes and Skin.

Effects of Overexposure: Inhalation of welding fumes and gases can be dangerous to your health. Short-term (acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Chromium (VI) compounds present in the fume may cause severe irritation of the bronchial tubes and lungs. Ingesting Chromium (VI) salts may cause injury or death. (Chromium (VI) compounds may burn eyes. Chromium compounds may cause allergic reactions in some people. Nickel oxides present in the fume may cause tightness around the chest, fever and allergic reactions in some people.

Manganese – Manganese dioxide (MnO₂): Short-term overexposure should be treated by removal from exposure and applying artificial respiration if needed. Wash eyes and/or skin with water to remove any dust particles. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Constant inhalation of Chromium (VI) compounds may cause an ulceration and perforation of the nasal septum as well as liver and kidney damage. Repetitive overexposure to nickel oxides may lead to lung fibrosis or pneumoconiosis. Workers exposed to Chromium

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(VI) compounds and/or nickel oxides have a higher incidence of lung fibrosis and nasal cancers. Chromium and nickel compounds are on the IARC (International Agency for Research of Cancer) as posing a carcinogenic risk to human.

Manganese – Manganese dioxide (MnO₂): Long-term overexposure to manganese compounds may have an effect upon the central nervous system. Symptoms such as muscular weakness, body tremors and behavioral changes may appear. Employees exposed to manganese compounds should get medical examinations several times annually for early detection of manganese poisoning.

Arc Rays can injure eyes and burn skin.

Electric shock can kill. See Section VIII

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.

Carcinogenicity OSHA (29 CFR 1910.1200) lists Nickel as a possible carcinogen.

SECTION VI: 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.

Reasonable expected fume constituents of this product would include: Complex oxides of iron, manganese, silicon, titanium, chromium, nickel and Molybdenum (316T-1, 316LT-1 and 317LT-1 only). Fume limit for Cr (VI) (0.05 mg/m³) may be reached before limit of 5 mg/m³ for general welding fumes is reached. Watch the CR (VI) level.

Flux or other ingredients	CAS No.	Exposure Limit (mg/m ³)	
		OSHA PEL	ACGIH TLV
Iron Oxide	1309-38-2	5	10 (as Fe ₂ O ₃)
Nickel Oxide	1313-99-1	Nothing found	1 (as Ni)
Molybdenum	7439-98-7	15 (Mo)	10 (Mo) 20**
Manganese	7439-96-5	5*	1* (Fume)
Chromium Oxide	1308-38-9	0.5 (as Cr)	0.5 (Ox)
Chromic Acid	1333-82-0	0.1*	0.05 (as Cr)
Silicon Oxide	7631-86-9	5	3
Titanium Oxide	13463-67-7	15	10, 20**
Nickel (Soluble)	-	1 (as Ni)	0.1 (as Ni)

*Ceiling Limit **Short Term Exposure Limit 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 VII: SPILL OR LEAK PROCEDURES

NOT APPLICABLE

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 Federal, State and Local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION (See Note)

“Read and understand the manufacturer's instructions and the precautionary label on the product. *Ventilation* – Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. *Respiratory Protection* – Use respirable fume respiratory or air-supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below a recommended exposure lime. *Eye Protection* – Wear helmet or use face shield with filter lens. Provide protective screens and flash goggles, if necessary, to shield others. As a rule of thumb start with a shade that is too dark to see the weld zone. Then go, the next lighter shade, which gives sufficient view of the weld

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zone. *Protective Clothing* – Wear hand, head, and body protection that help to prevent injury from radiation, sparks, and electric 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 welder not to touch live electrical parts and to insulate himself from work and ground.”

SECTION IX: SPECIAL PRECAUTIONS (See Note)

OTHER PRECAUTIONS: Use exhaust system to clear welding fumes. Make sure that inhaled air does not contain fume constituents above permissible exposure levels.

NOTE: Other precautions for additional safety information on welding and cutting, see American Standard Z49.1-1983, Safety in Welding and Cutting, and the Welding Handbook, Vol. 1, Chapter 9, Safe Practices in Welding and Cutting, both available from American Welding Society, Inc. 550 NW Le Jeune Road, P.O. Box 351040, Miami, FL 33135, Tel. (305) 443-9353.

Weld Wire Company Inc. believes that information set forth in this Material Safety Data Sheet is accurate. Weld Wire Company Inc. makes no warranty, expressed or implied, with respect thereto and disclaims any liability from reliance therein.