1. PRODUCT & COMPANY IDENTIFICATION

1.1	Product Name:	**1/8 IN AWS MILD STEEL WELDING ELECTRODE E6011**
1.2	Chemical Name:	Metal Alloy
1.3	Synonyms:	P/N 97733
1.4	Trade Names:	Chicago Electric Welding
1.5	Product Uses & Restrictions:	Welding Electrode
1.6	Distributor's Name:	Harbor Freight Tools USA, Inc.
1.7	Distributor's Address:	26541 Agoura Road, Calabasas, CA 91302 USA
1.8	Emergency Phone:	**CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN 676687)**
1.9	Business Phone / Fax:	+1 (805) 388-1000

2. HAZARDS IDENTIFICATION

2.1 Hazard Identification:

This product is classified as a HAZARDOUS SUBSTANCE but not as DANGEROUS GOODS according to the classification criteria of NOHSC: 1088 (1999) and ADG Code (Australia).

DANGER! MAY CAUSE CANCER. MAY CAUSE DAMAGE TO ORGANS (LUNGS, BONES) THROUGH PROLONGED OR REPEATED EXPOSURE. CAUSES SERIOUS EYE IRRITATION. MAY CAUSE RESPIRATORY IRRITATION.

Classification: Carc. 1A; STOT RE 2; Eye Irrit. 2; STOT SE 3

Hazard Statements (H): H350 – May cause cancer. H319 – Causes serious eye irritation. H335 – May cause respiratory irritation. H372 – Causes damage to organs (lungs, bones) through prolonged or repeated exposure.

Precautionary Statements (P): P201 – Obtain special instructions before use. P202 – Do not handle until all safety precautions have been read and understood. P260 – Do not breathe dust/fume. P264 – Wash hands and exposed skin areas with soap and warm water thoroughly after handling. P270 – Do not eat, drink or smoke when using this product. P271 – Use only outdoors or in a well-ventilated area. P280 – Wear protective gloves/protective clothing/eye protection/face protection. P304+P340 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313 – IF exposed or concerned: Get medical advice/attention. P314 – Get medical advice/attention if you feel unwell. P337+P313 – If eye irritation persists: Get medical advice/attention. P405 – Store locked up. P501 – Dispose of contents and container to a licensed treatment, storage or disposal facility (TSDF).



3. COMPOSITION & INGREDIENT INFORMATION

CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	EXPOSURE LIMITS IN AIR (mg/m³) ACGIH ppm TLV	ACGIH ppm STEL	NOHSC ppm ES-TWA	NOHSC ppm ES-STEL	NOHSC ppm ES-PEAK	OSHA ppm PEL	OSHA ppm STEL	OSHA ppm IDLH	OTHER
IRON	7439-89-6	NO4565500	231-096-4	60-100	(5)	NA	NF	NF	NF	(10)	NA	NA	0.5 – NIOSH
	Acute Tox. 4 *; Skin Corr. 1A; H302, H314												
MANGANESE	7439-96-5	OO9275000	231-105-1	0.1-1	NA	NA	(1)	NF	NF	NA	NA	500	
SILICON	7440-21-3	VW0400000	231-130-8	0.1-1	(10.0)	NA	(10.0)	NF	NF	(10.0)	NA	NA	
CARBON	1333-86-4	FF5800000	215-609-9	0-0.1	(3.5)	NA	NF	(3)	NF	(3.5)	NA	(1750)	
SULFUR	7704-34-9	NA	231-722-6	0-0.1	(0.02)	NA	NF	(0.1)	NF	NA	NA	(5)	
	Skin Irrit. 2; H315												
PHOSPHOROUS	7723-14-0	TH3500000	231-768-7	0-0.1	(0.02)	NA	NF	(0.1)	NF	NA	NA	(5)	
	Pyr. Sol. 1; Acute Tox. 2 *; Acute Tox. 2 *; Skin Corr. 1A; Aquatic Acute 1; H250, H330, H300, H314, H400												
METAL OXIDE (COATING)													
TITANIUM DIOXIDE	13463-67-7	XR2275000	236-675-5	15-40	(10)	NA	NF	NF	NF	(5)	NA	5000	
SILICON DIOXIDE	14808-60-7	VV7330000	238-878-4	15-40	(0.025)	NA	NF	(0.1)	NF	(0.1)	NA	(50)	
	STOT RE 1; H372												
MAGNESIUM OXIDE	1309-48-4	OM3850000	215-171-9	10-30	NA	NA	NF	NF	NF	NA	NA	NA	
MANGANESE (II) OXIDE	1344-43-0	NA	215-695-8	7-13	NA	NA	NF	NF	NF	NA	NA	NA	
CALCIUM OXIDE	1305-78-8	EW3100000	215-138-9	7-13	NA	NA	NF	NF	NF	NA	NA	NA	
	Skin Irrit. 2; Eye Dam. 1; STOT SE 3; H315, H318, H335												
ALUMINA	1344-28-1	BD1200000	215-691-6	1-5	NA	NA	NF	NF	NF	NA	NA	NA	
DIPOTASSIUM OXIDE	12136-45-7	NA	235-227-6	1-3	NA	NA	NF	NF	NF	NA	NA	NA	
DISODIUM OXIDE	1313-59-3	NA	215-208-9	0.1-1	NA	NA	NF	NF	NF	NA	NA	NA	
	Skin Corr. 1B; H314												

4. FIRST AID MEASURES

4.1	First Aid:	Ingestion:	Ingestion is unlikely; however, particulates from grinding or cutting may be ingested. **DO NOT INDUCE VOMITING**. Contact ChemTrec at +1 (703) 527-3887 or the nearest Poison Control Center or local emergency telephone number for assistance and instructions. Seek immediate medical attention. If vomiting occurs spontaneously, keep victim's head lowered (forward) to reduce the risk of aspiration.
		Eyes:	Flush eyes thoroughly with copious amounts of water for at least 15 minutes, holding eyelid(s) open to ensure complete flushing. If irritation persists, seek immediate medical attention. Arc rays can injure eyes. If exposed to arc rays, move victim to a dark room and remove contact lenses, cover eyes with padded dressing and seek medical advice/attention.
		Skin:	Remove contaminated clothing and wash affected areas with soap and water. If irritation persists, seek prompt medical attention. Do not wear contaminated clothing until after it has been properly cleaned.
		Inhalation:	Remove victim to fresh air at once. If breathing is difficult, administer supplemental oxygen and seek immediate medical attention. If breathing stops, perform artificial respiration.
4.2	Effects of Exposure:	Ingestion:	Gastrointestinal irritation, nausea, and/or vomiting.
		Eyes:	Mild to moderate irritant.
		Skin:	Redness, irritation, rash at site of exposure.
		Inhalation:	Inhalation of fumes can cause a metallic taste, tightness in the chest, nausea, fever, fatigue and allergic reaction. Fumes may cause irritation to nasal membranes, bronchial tubes and lungs.
4.3	Symptoms of Overexposure:	Ingestion:	Intestinal discomfort, nausea, vomiting, and diarrhea.
		Eyes:	Mild irritation, redness, and watering.
		Skin:	Contact dermatitis, characterized by localized red or puffy dry skin and itching.
		Inhalation:	Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, metal fume fever, difficulty in breathing, frequent coughing, or chest pain.
4.4	Acute Health Effects:	Ingestion:	Gastrointestinal irritation and central nervous system depression.
		Eyes:	Mild to moderate irritant.
		Skin:	Prolonged or repeated contact may cause contact dermatitis (localized redness or rash).
		Inhalation:	Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, metal fume fever, difficulty in breathing, frequent coughing, or chest pain. Overexposure to metals oxide may cause metal fume fever characterized by metallic taste, tightness of chest and fever. Symptoms may last 24-48 hours following overexposure.
4.5	Chronic Health Effects:	Ingestion:	Ingestion or inhalation of fumes may cause gastrointestinal disturbance.
		Eyes:	None reported by the manufacturer.
		Skin:	Prolonged or repeated contact may cause contact dermatitis (localized redness or rash).
		Inhalation:	Long term exposure to welding and allied processes gases, dusts and fumes may contribute to pulmonary irritation or pneumoconiosis or "siderosis." Inhalation of fumes can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Long-term overexposure to manganese compounds may affect the central nervous system. Symptoms may be similar to Parkinson's Disease and can include slowness, changes in handwriting, gait impairment, muscle spasms and cramps and less commonly, tremor and behavioral changes. Employees who are overexposed to manganese compounds should be seen by a physician for early detection of neurologic problems.
4.6	Target Organs:	Eyes, Skin & Respiratory System.	
4.7	Medical Conditions Aggravated by Exposure:	Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to welding fumes; however, such reaction cannot be predicted due to the variation in the composition and in the quantity of the decomposition products.	

HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARDS	0
PROTECTIVE EQUIPMENT	E

EYES	SKIN	LUNGS

5. FIREFIGHTING MEASURES

5.1	Fire & Explosion Hazards:	This product is not flammable. Welding slag or sparks may cause fire. Keep away from combustible material. When exposed to high temperatures, toxic fumes may be released.
5.2	Extinguishing Methods:	Water, Dry Chemical, Foam, & Carbon Dioxide.
5.3	Firefighting Procedures:	Fight fires as for surrounding materials. Firefighters should wear a MSHA/NIOSH approved or equivalent self-contained breathing apparatus (SCBA) and protective clothing. Fire should be fought from a safe distance. Keep containers cool until well after the fire is out. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway.



6. ACCIDENTAL RELEASE MEASURES

6.1	Spills:	Before cleaning any spill, individuals involved in spill cleanup must wear appropriate Personal Protective Equipment including gloves, glasses and NIOSH approved (or equivalent) dust respirator. Spilled product may produce a tripping hazard. Particulate from grinding, welding or burning may produce a slipping hazard. Carefully vacuum or sweep up the particulate, slag, dusts or powders. Dispose of properly in accordance with local, state and federal regulations. Wash all affected areas. Remove any contaminated clothing and wash thoroughly before reuse.

7. HANDLING & STORAGE INFORMATION

7.1	Work & Hygiene Practices:	Avoid contact to eyes, skin, and mucous membranes. Avoid inhalation of vapors, gases, fumes and dusts. Wash thoroughly after handling and use. Do not smoke, eat, drink, chew gum or tobacco, or apply cosmetics within the working area. Do not store or bring tobacco products, gum, food, drinks or cosmetics within the working area. Otherwise follow the standards of good industrial hygiene practices.
7.2	Storage & Handling:	No unusual methods are required. Keep product contained and retain all warning and identity labels. Preferred storage is a sheltered warm area with temperature and humidity control to prevent high humidity and "going through the dew point." Keep away from incompatible materials (e.g., strong acids, alkalis, oxidizers) – see also Section 10. Open containers slowly on a stable surface. Keep container tightly closed when not in use.
7.3	Special Precautions:	Read and understand the manufacturer's instructions and the precautionary label on this product. See American National Standard Z-49.1, "Safety in Welding, Cutting and Allied Processes," 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 additional details regarding fire and explosion control, exposure control and other special precautions.

8. EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1 Exposure Limits: ppm (mg/m^3)

	ACGIH		NOHSC			OSHA			OTHER
CHEMICAL NAME(S)	TLV	STEL	ES-TWA	ES-STEL	ES-PEAK	PEL	STEL	IDLH	
IRON	(5)	NA	NF	NF	NF	(10)	NA	NA	0.5 – NIOSH
MANGANESE	NA	NA	(1)	NF	NF	NA	NA	500	
SILICON	(10.0)	NA	(10.0)	NF	NF	(10.0)	NA	NA	
CARBON	(3.5)	NA	NF	(3)	NF	(3.5)	NA	(1750)	
SULFUR	(0.02)	NA	NF	(0.1)	NF	NA	NA	(5)	
PHOSPHOROUS	(0.02)	NA	NF	(0.1)	NF	NA	NA	(5)	
TITANIUM DIOXIDE	(10)	NA	NF	NF	NF	(5)	NA	5000	
SILICON DIOXIDE	(0.025)	NA	NF	(0.1)	NF	(0.1)	NA	(50)	

8.2	Ventilation & Engineering Controls:	Use industrial hygiene monitoring equipment to ensure that exposure does not exceed threshold limit values. Use with adequate ventilation (e.g., open doors and windows, local exhaust ventilation). Ensure appropriate decontamination equipment is available (e.g., sink, safety shower, eye-wash station). Use in a chemical fume hood when working with large quantities of product and provide adequate ventilation (e.g., local exhaust ventilation, fans).	
8.3	Respiratory Protection:	CAUTION: Welding or cutting may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. Use NIOSH approved respiratory protection. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society. 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 TLVs and the equivalent exposure must compute to less than one. Keep exposure as low as possible. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the TLV. Where respiratory protection is necessary, NIOSH approved respiratory protection should be used. The selection of the appropriate respiratory protection (dust respirator, etc.) should be based on the actual or potential airborne contaminants and their concentrations present.	
8.4	Eye Protection:	Wear helmet or use face shield with filter lens according to ANSI Z87.1. Provide protective screens and flash goggles, if necessary, to shield others. Wear safety glasses with UV protective side shields or goggles. Wear contact lenses in combination with safety eyewear, except where the contact lenses create a likelihood of injury from intense heat, highly particulate atmosphere, or where their use is prohibited.	
8.5	Hand Protection:	Wear head, hand and body protection that help to prevent injury from hot metal, sparks, slag, infrared radiation, UV radiation, abrasions, contusions and heat stress. Protective clothing will not generally prevent shock except for leather if kept dry. Gloves made of leather with inside seams (or those that give equal performance) are preferred. If necessary, refer to U.S. OSHA 29 CFR §1910.138, the appropriate standards of Canada, or the EU member states.	
8.6	Body Protection:	Wear head, hand and body protection that help to prevent injury from radiation, sparks and electrical shock. Wear flame resistant ear plugs to keep sparks out of ears. See ANSI Z-49.1. The clothing may include heat/fire resistant gloves, overalls, aprons, sleeves, footwear, welder's spats and head cover. Wear garments made of leather, heavyweight tightly woven wool or cotton. Keep clothing clean (free of oil, grease or solvents) and in good repair. Do not wear clothing with frayed edges, tears or holes. Do not roll up sleeves or trousers (pants should not be cuffed). . If necessary, refer to appropriate standards of Canada, the EU member states, or U.S. OSHA.	

9. PHYSICAL & CHEMICAL PROPERTIES

9.1	Appearance:	Solid grey article
9.2	Odor:	Odorless
9.3	Odor Threshold:	NA
9.4	pH:	NA
9.5	Melting Point/Freezing Point:	~ 1500 °C
9.6	Initial Boiling Point/Boiling Range:	NA
9.7	Flashpoint:	NA
9.8	Upper/Lower Flammability Limits:	NA
9.9	Vapor Pressure:	NA
9.10	Vapor Density:	NA
9.11	Relative Density:	NA
9.12	Solubility:	Insoluble
9.13	Partition Coefficient (log P_{ow}):	NA
9.14	Autoignition Temperature:	NA
9.15	Decomposition Temperature:	NA
9.16	Viscosity:	NA
9.17	Other Information:	NA

10. STABILITY & REACTIVITY

10.1	Stability:	Stable under normal conditions of use (See Section 7).
10.2	Hazardous Decomposition Products:	Irritating vapors and toxic gases (e.g., carbon monoxide and carbon dioxide) when involved in fire.
10.3	Hazardous Polymerization:	Will not occur.
10.4	Conditions to Avoid:	Use or storage near incompatible substances.
10.5	Incompatible Substances:	Strong oxidizing agents, strong acids and bases.

11. TOXICOLOGICAL INFORMATION

11.1	Routes of Entry:	Inhalation:	NO	Absorption:	YES	Ingestion:	YES
11.2	Toxicity Data:	This material or its emission may induce an allergic of sensitization reaction and thereby aggravate existing systemic disease.					
11.3	Acute Toxicity:	Overexposure to welding fumes may cause: fever, nausea, giddiness, eye irritation to the respiratory tract and to other mucous membranes. May aggravate pre-existing respiratory conditions (e.g., asthma, emphysema).					
11.4	Chronic Toxicity:	Overexposure to welding fumes may cause: pulmonary disease and/or cause breathing difficulty. Overexposure to manganese fumes may affect the brain and central nervous system, resulting in poor coordination, loss of motor control, and tremor in the extremities, which may be irreversible. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lungs), central nervous system effects, bronchitis and other pulmonary effects. Respiratory exposure to crystalline silica present in the weld wire or electrode is not anticipated during normal use. Respiratory overexposure to airborne crystalline silica is known to cause silicosis.					
11.5	Suspected Carcinogen:	Carbon is listed as IARC Group 2B (Possibly carcinogenic to humans). Welding Fumes is listed as IARC Group 2B (Possibly carcinogenic to humans).					
11.6	Reproductive Toxicity:	This product is not reported to cause reproductive toxicity in humans.					
	Mutagenicity:	This product is not reported to produce mutagenic effects in humans.					
	Embryotoxicity:	This product is not reported to produce embryotoxic effects in humans.					
	Teratogenicity:	This product is not reported to cause teratogenic effects in humans.					
	Reproductive Toxicity:	This product is not reported to cause reproductive effects in humans.					
11.7	Irritancy of Product:	General Nuisance Dusts: Many of the metal oxides generated as components of welding fume, are considered nuisance dusts (such as oxides of titanium and aluminum), which are essentially non-toxic and chemically non-irritating. Skin contact has shown no problems other than possible drying and mechanical irritation. Eye contact can produce particulate irritation.					
11.8	Biological Exposure Indices:	NE					
11.9	Physician Recommendations:	Treat symptomatically.					

12. ECOLOGICAL INFORMATION

12.1	Environmental Stability:	There are no specific data available for this product.
12.2	Effects on Plants & Animals:	There are no specific data available for this product.
12.3	Effects on Aquatic Life:	There are no specific data available for this product.

13. DISPOSAL CONSIDERATIONS

13.1	Waste Disposal:	Waste disposal must be in accordance with appropriate Federal, state, provincial and local regulations.
13.2	Special Considerations:	NA

14. TRANSPORTATION INFORMATION

The basic description (ID Number, proper shipping name, hazard class & division, packing group) is shown for each mode of transportation. Additional descriptive information may be required by 49 CFR, IATA/ICAO, IMDG and the CTDGR.

14.1	49 CFR (GND):	NOT REGULATED	
14.2	IATA (AIR):	NOT REGULATED	
14.3	IMDG (OCN):	NOT REGULATED	
14.4	TDGR (Canadian GND):	NOT REGULATED	
14.5	ADR/RID (EU):	NOT REGULATED	
14.6	SCT (MEXICO):	NOT REGULATED	
14.7	ADGR (AUS):	NOT REGULATED	

15. REGULATORY INFORMATION

15.1	SARA Reporting Requirements:	This product Manganese and Alumina, substances subject to SARA Title III, section 313 reporting requirements.	
15.2	SARA Threshold Planning Quantity:	There are no specific Threshold Planning Quantities for the components of this product.	
15.3	TSCA Inventory Status:	The components of this product are listed on the TSCA Inventory or are otherwise exempt.	
15.4	CERCLA Reportable Quantity (RQ):	Sulfur: 0.454 kg (1 lbs)	
15.5	Other Federal Requirements:	Manganese (and its compounds) is listed as Hazardous Air Pollutants (HAPs). Manganese (and its compounds) is listed as Toxic Pollutants under the Clean Water Act (CWA). Zinc (and its compounds) is listed as Priority Pollutants under the Clean Water Act (CWA). This product does not contain any Class 1 or Class 2 ozone depletors.	
15.6	Other Canadian Regulations:	This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDSL. None of the components of this product are listed on the Priorities Substances List. WHMIS Classification: D2B (Other Toxic Effects).	
15.7	State Regulatory Information:	Manganese is found on the following state criteria lists: Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), Pennsylvania Right-to-Know List (PA), and Washington Permissible Exposures List (WA). Aluminum is found on the following state criteria lists: MA, MN, NJ and PA. Magnesium is found on the following state criteria lists: FL, MA and PA. Magnesium Oxide is found on the following state criteria lists: FL, MA, MN, PA and WA. Silicon is found on the following state criteria lists: MA, MN, PA, and WA. Silicon Dioxide is found on the following state criteria lists: FL, MA, MN, NJ, PA and WA Phosphorous is found on the following state criteria lists: FL, MA, MN, NJ, PA and WA. Sulfur is found on the following state criteria lists: FL, MA and PA. Calcium Oxide is found on the following state criteria lists: FL, MA, MN, PA and WA. Alumina is found on the following state criteria lists: MA, MN, NJ, PA and WA. None of the other ingredients in this product, present in a concentration of 1.0% or greater, are listed on any of the following state criteria lists: California Proposition 65 (CA65), Delaware Air Quality Management List (DE), Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI). **NOTE**: This product contains a substance(s) known to the State of California to cause cancer, birth defects or other reproductive harm.	
15.8	Other Requirements:	The primary components of this product are not listed in Annex I of EU Directive 67/548/EEC: Harmful (Xn). Risk Phrases (R): 9-20-24/25 - Use only in well ventilated areas. Harmful by inhalation. Avoid contact with skin and eyes. Safety Phrases (S): 22-36/37/39-38-51 - Do not breathe gas/fumes/spray. Wear suitable protective clothing, gloves and eye/face protection. In case of insufficient ventilation wear suitable respiratory equipment. Use only in well-ventilated areas.	

16. OTHER INFORMATION

16.1	Other Information:	**DANGER! MAY CAUSE CANCER. MAY CAUSE DAMAGE TO ORGANS (LUNGS, BONES) THROUGH PROLONGED OR REPEATED EXPOSURE. CAUSES SERIOUS EYE IRRITATION. MAY CAUSE RESPIRATORY IRRITATION.** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume. Wash hands and exposed skin areas with soap and warm water thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/attention. Store locked up. **NOTE**: Local ventilation should be used during handling and use. Good housekeeping and personal hygiene are recommended. Some individuals may show sensitivity to exposure. Failure to observe proper practices may be hazardous to health. Use only in well-ventilated areas. Harmful by inhalation. Avoid contact with skin and eyes. Do not breathe gas, fumes, vapor or spray. Wear suitable protective clothing, gloves and eye/face protection. In case of insufficient ventilation wear suitable respiratory protective equipment. Avoid overexposure to metal fumes, powders and particulates. **WARNING**: Electric shock from welding equipment or electrodes may be fatal. The welding process uses electrical circuits that sustain a welding arc between the electrode and the base plate. The welding arc converts the electrical energy into a localized, concentrated heat source. The tremendously high temperatures of the arc cause the welding continuous wire and rod electrode (or filler metal, when used as such) to decompose. Electric arc working may create one or more health hazards. Hot metal spatter and heat from electric arcs, welding flames or the thermal spray process may cause burns to the hands and body or may cause fire if it comes into contact with combustible materials. UV, IR and light radiation from an electric arc may cause damage to unprotected eyes. Wear suitable protective equipment. Fumes and gases generated during the welding process can be harmful to your health and noise generated during welding can damage hearing. See also American National Standard Z-49.1, “Safety in Welding, Cutting and Allied Processes” published by the American Welding Society for additional safety precautions and hazard warnings. **NOTE**: This product contains a substance(s) known to the State of California to cause cancer, birth defects or other reproductive harm.
16.2	Terms & Definitions:	See last page of this Safety Data Sheet.
16.3	Disclaimer:	This Safety Data Sheet is offered pursuant to OSHA’s Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of ShipMate's & Harbor Freight Tools USA, Inc.’s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.
16.4	Prepared for:	**Harbor Freight Tools USA, Inc.** 26541 Agoura Road Calabasas, CA 91302 USA Tel: +1 (805) 388-1000 http://www.harborfreight.com/
16.5	Prepared by:	**ShipMate, Inc.** P.O. Box 787 Sisters, Oregon 97759-0787 USA Tel: +1 (310) 370-3600 Fax: +1 (310) 370-5700 http://www.shipmate.com

DEFINITION OF TERMS

A large number of abbreviations and acronyms appear on a SDS. Some of these that are commonly used include the following:

GENERAL INFORMATION:

CAS No.	Chemical Abstract Service Number

EXPOSURE LIMITS IN AIR:

ACGIH	American Conference on Governmental Industrial Hygienists
C	Ceiling Limit
ES	Exposure Standard (Australia)
IDLH	Immediately Dangerous to Life and Health
OSHA	U.S. Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short-Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average

FIRST AID MEASURES:

CPR	Cardiopulmonary resuscitation - method in which a person whose heart has stopped receives manual chest compressions and breathing to circulate blood and provide oxygen to the body.

HMIS-III HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard

HEALTH
FLAMMABILITY
PHYSICAL HAZARDS
PERSONAL PROTECTION

PERSONAL PROTECTION RATINGS:

A		**G**	
B		**H**	
C		**I**	
D		**J**	
E		**K**	
F		**X**	**Consult your supervisor or SOPs for special handling directions.**

Safety Glasses | **Splash Goggles** | **Face Shield & Protective Eyewear** | **Gloves**

Boots | **Synthetic Apron** | **Protective Clothing & Full Suit** | **Dust Respirator**

Full Face Respirator | **Dust & Vapor Half-Mask Respirator** | **Full Face Respirator** | **Airline Hood/Mask or SCBA**

OTHER STANDARD ABBREVIATIONS:

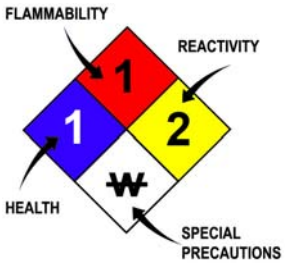
ML	Maximum Limit
mg/m3	milligrams per cubic meter
NA	Not Available
ND	Not Determined
NE	Not Established
NF	Not Found
NR	No Results
ppm	parts per million
SCBA	Self-Contained Breathing Apparatus

NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

FLAMMABILITY LIMITS IN AIR:	
Autoignition Temperature	Minimum temperature required to initiate combustion in air with no other source of ignition
LEL	Lower Explosive Limit - lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source
UEL	Upper Explosive Limit - highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source

HAZARD RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard
ACD	Acidic
ALK	Alkaline
COR	Corrosive
W	Use No Water
OX	Oxidizer
TREFOIL	Radioactive



TOXICOLOGICAL INFORMATION:

LD_{50}	Lethal Dose (solids & liquids) which kills 50% of the exposed animals
LC_{50}	Lethal concentration (gases) which kills 50% of the exposed animal
ppm	Concentration expressed in parts of material per million parts
TD_{lo}	Lowest dose to cause a symptom
TCLo	Lowest concentration to cause a symptom
TD_{lo}, LD_{lo}, & LD_o or TC, TC_o, LC_{lo}, & LC_o	Lowest dose (or concentration) to cause lethal or toxic effects
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
RTECS	Registry of Toxic Effects of Chemical Substances
BCF	Bioconcentration Factor
TL_m	Median threshold limit
log K_{OW} or log K_{OC}	Coefficient of Oil/Water Distribution

REGULATORY INFORMATION:

WHMIS	Canadian Workplace Hazardous Material Information System
DOT	U.S. Department of Transportation
TC	Transport Canada
EPA	U.S. Environmental Protection Agency
DSL	Canadian Domestic Substance List
NOHSC	National Occupational Health and Safety Commission (Australia)
NDSL	Canadian Non-Domestic Substance List
PSL	Canadian Priority Substances List
TSCA	U.S. Toxic Substance Control Act
EU	European Union (European Union Directive 67/548/EEC)
WGK	Wassergefährdungsklassen (German Water Hazard Class)
HMIS-III	National Paint & Coatings Association Hazardous Materials Identification System

WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

Class A	Class B	Class C	Class D1	Class D2	Class D3	Class E	Class F
Compressed	Flammable	Oxidizing	Toxic	Irritation	Infectious	Corrosive	Reactive

EC (67/548/EEC) INFORMATION:

C	E	F	N	O	T	Xi	Xn
Corrosive	Explosive	Flammable	Harmful	Oxidizing	Toxic	Irritant	Harmful

CLP/GHS (1272/2008/EC) PICTOGRAMS:

GHS01	GHS02	GHS03	GHS04	GHS05	GHS06	GHS07	GHS08	GHS09
Explosive	Flammable	Oxidizer	Pressurized	Corrosive	Toxic	Harmful Irritating	Health Hazard	Environ-ment