



Code: MIG-WIRE
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WOLVERINE JOINING TECHNOLOGIES, LLC.

MATERIAL SAFETY DATA SHEET

Product: Mild Steel MIG Wire, ER70S-6, ER70S-3
 ALLOY: 35498, 35500

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Common Name : METAL ALLOY
 Chemical Name : CHEMICAL MIXTURE
 Formula : CHEMICAL MIXTURE
 Product CAS No.: CHEMICAL MIXTURE
 Product Use : Metal Welding

Supplier : WOLVERINE JOINING TECHNOLOGIES, LLC.
 Address : 235 KILVERT STREET
 City, State, Zip: WARWICK, RI 02886
 Phone : 1-401-739-9550

FOR CHEMICAL EMERGENCY CALL CHEMTREC (24 HOURS):
 1-800-424-9300 (US, Canada, Puerto Rico, Virgin Islands)
 1-703-527-3887 (Outside Above Area)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO.	% Wt.	% Wt. ER70S-6	ER70S-3
IRON	7439-89-6	Balance	Balance	Balance
CARBON	7440-44-0	0.06-0.15	0.06-0.15	
MANGANESE	7439-96-5	1.40-1.85	0.90-1.40	
SILICON	7440-21-3	0.80-1.15	0.45-0.75	
PHOSPHORUS	7723-14-0	0.025Max	0.025Max	
SULFUR	7440-34-9	0.035Max	0.035Max	
COPPER	7440-50-8	0.50 Max	0.50 Max	0.50 Max

(NOTE: Ni, Cr, Mo, V = Residual elements shall not exceed 0.50% in total)
 (See Section 8 for Exposure Limits and Section 11 for Toxicological Information)

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

These products consist of solid wire or rods, which are odorless and may be copper coated. There are no immediate health hazards associated with the wire or rod form of this product. These products are not reactive. If involved in a fire, these products may generate irritating iron fumes and a variety of metal oxides. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE

The most significant routes of over-exposure for these products are by skin or eye contact. During welding operations, the most significant route of over-exposure is via inhalation of fumes.

INHALATION: Inhalation is not anticipated to be a significant route of over-exposure to the wire or rods. Inhalation of large amounts of particulates generated by this product during melt processing operations may result in pneumoconiosis (a disease of the lungs). Repeated over-exposure, via inhalation, to the dusts or fumes generated by this product may have adverse effects on the lungs with possible pulmonary edema and emphysema (life threatening lung injuries). Refer to Section 10 (Stability and Reactivity) for information on the specific composition of welding fumes and gases.

CONTACT WITH SKIN or EYES: Contact of the wire or rod form of these products with the skin is not anticipated to be irritating. Contact with the wire or rod form of these products can be physically damaging to the eye. Fumes generated during welding operations can be irritating to the skin and eyes. Symptoms of skin over-exposure may include irritation and redness; prolonged or repeated skin over-exposure may lead to dermatitis. Contact with the molten wire and rods will burn contaminated skin or eyes.

SKIN ABSORPTION: Skin absorption is not known to be a significant route of over-exposure for any component of these products.

INGESTION: Ingestion is not anticipated to be a significant route of over-exposure for any components of these products.

INJECTION: Though not a likely route of occupational exposure for these products, injection (via punctures or lacerations in the skin) may cause local reddening, tissue swelling, and discomfort.

HEALTH EFFECTS OR RISK FROM EXPOSURE: An Explanation in Lay Terms, Symptoms associated with overexposure to this product and fumes generated during welding operations are as follows:

ACUTE: The chief acute health hazard associated with these products would be the potential for irritation of contaminated skin and eyes when exposed to fumes during welding operations. Inhalation of large amounts of particulates generated by these products during metal processing operations can result in pneumoconiosis (a disease of the lungs). Contact with molten metal will burn contaminated skin or eyes.

CHRONIC: Chronic skin over-exposure to the fumes of these products during welding operations may produce dermatitis (red, inflamed skin). Repeated over-exposure to the fumes generated by this product via inhalation can have adverse effects on the lungs (e.g. pulmonary edema and emphysema). Repeated or prolonged ingestion exposures of >50-100 mg of Iron per day can result in deposition of iron in the body tissues, which can cause disease.

CARCINOGENICITY

NTP? NO

IARC? NO

OSHA? NO

NOTE: See Section 8 for Exposure Limits, Section 11 for Toxicological Information and Section 12 for Ecological Information.

SECTION 4: FIRST AID MEASURES

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of label and MSDS to health professional with victim.

SKIN EXPOSURE: If fumes generated by welding operations involving this product contaminate the skin, begin decontamination with running water. If molten material contaminates the skin, immediately begin decontamination with cold, running water. Minimum flushing is for 15 minutes. Victim must seek medical attention if any adverse reaction occurs.

EYE EXPOSURE: If fumes generated by welding operations involving this product enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention.

INHALATION: If fumes generated by welding operations involving this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

INGESTION: If swallowed, call physician immediately. Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders may be aggravated by prolonged over-exposures to the dusts or fumes generated by this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

SECTION 5: FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): Not flammable.

AUTO IGNITION TEMPERATURE, °C: Not flammable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable

Upper (UEL): Not applicable

FIRE EXTINGUISHING MATERIALS:

Water Spray: YES Carbon Dioxide: YES

Halon: YES Foam: YES

Dry Chemical: YES Other: Any "ABC" Class

UNUSUAL FIRE AND EXPLOSION HAZARDS When involved in a fire, these products may decompose and produce irritating fumes containing iron compounds and metal oxides. The molten material can present a significant thermal hazard to firefighters.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive

SPECIAL FIRE FIGHTING PROCEDURES: N/A

Health: 0

Flammable: 0

Reactivity: 0

HMIS HAZARD CLASSIFICATION

Health: 0

Flammable: 0

Reactivity: 0

Special: B

SECTION 6: ACCIDENTAL RELEASE MEASURES

Vacuum or scoop the spilled material into a container for reclamation or disposal.

****NOTE**** In the event of an accidental release of this material, the above procedures should be followed. Additionally, proper exposure controls and personal protection equipment should be used (see Section 8: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this product. Use ventilation and other engineering controls to minimize potential exposure to this product.
STORAGE AND HANDLING PRACTICES: All employees who handle this product should be trained to handle it safely. Use in a well-ventilated location. Avoid breathing fumes of this product during welding operations. Open containers on a stable surface. Packages of this product must be properly labeled.

When this product is used during welding operations, follow the requirements of the Federal Occupational Safety and Health Welding and Cutting Standard (29 CFR 1910 Subpart Q) and the safety standards of the American National Standards Institute for welding and cutting (ANSI Z49.1). Store packages in a cool, dry location. Store away from incompatible materials (see Section 10, Stability and Reactivity).

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Not applicable.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and information on ingredients). Prudent practice is to ensure eyewash/safety shower stations are available near areas where these products are used.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and information on ingredients). If respiratory protection is needed (i.e., a Weld Fume Respirator, or Air-line Respirator for welding in confined spaces), use only protection authorized in 29 CFR 1910.134 or applicable State regulations, Respiratory Protection is recommended to be worn during welding operations. Use supplied air respiration protection if oxygen levels are below 19.5% or are unknown.

EYE PROTECTION: Safety glasses. When these products are used in conjunction with welding, wear safety glasses, goggles, or face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting").

HAND PROTECTION: Wear gloves for routine industrial used. When these products are used in conjunction with welding, wear gloves that protect from sparks and flame (per ANSI Z49.1-1988, "Safety in Welding and Cutting").

BODY PROTECTION: Wear body protection appropriate for task.

EXPOSURE LIMITS

INGREDIENT	PEL-OSHA	TLV-ACGIH
IRON		
CAS NO.: 7439-89-6	10 mg/m3 (Respirable fume or dust)	5 mg/m3
CARBON		
CAS NO.: 7440-44-0	15 mg/m3 (Total dust)	10 mg/m3 (Inhalable) 3 mg/m3 (Respirable dust)
MANGANESE		
CASNO.:7439-96-5	1 mg/m3 (Vacated 1989PEL)	0.2 mg/m3
SILICON		
CAS NO.: 7440-21-3	15 mg/m3 (Total dust) 5 mg/m3 (Respirable)	10 mg/m3

NOTE: The permissible exposure limits (PELs), threshold limit values (TLVs), potential health effects statements and SARA hazard categories may not be applicable as the hazardous ingredients listed are in the solid form. If dust, powder or fume is generated then these statements will be applicable.

Unless otherwise noted, all values are reported as 8-hour Time-Weighted Averages (TWAs) and total dust (particulates only). All ACGIH TLVs refer to the 1998 Standards. All OSHA PELs refer to 29 CFR Part 1910 Air Contaminants: Final Rule, January 19, 1989.

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved respirator is recommended if dust is generated.

VENTILATION

General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT

Refer to ANSI/ASC Z49.1-94 (Safety in Welding, Cutting and Allied Processes), published by the American Welding Society, for further information on the selection of personal protective equipment. Safety glasses (with side shields). Body protection as necessary to prevent skin contact.

PERSONNEL SAMPLING PROCEDURE

For ALUMINUM: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7013.

For METALLIC COMPONENTS: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7300.

For NUISANCE DUST: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 0500.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

The following information is for elemental Iron:

RELATIVE VAPOR DENSITY (air = 1): N/A
SPECIFIC GRAVITY @ 20°C (water = 1): 7.86
SOLUBILITY IN WATER: Insoluble
VAPOR PRESSURE, mm Hg @ 1810°C: N/A
ODOR THRESHOLD: Not Applicable
EVAPORATION RATE (nBuAc = 1): N/A
FREEZING/MELTING POINT: 1535°C (2795°F)
pH: Not Applicable
BOILING POINT @ 24 mm Hg: 3000°C (5432°F)
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not Applicable
APPEARANCE AND COLOR: These products consist of solid wire or rods, which are odorless and may be copper coated.
HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance is a distinctive characteristic of this product.

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Iron compounds and metal oxides.

NOTE: The composition and quality of welding fumes and gases are dependent upon the metal being welded, the process, the procedure, and the electrodes used. Other conditions that could also influence the composition and quantity of fumes and gases to which workers may be exposed include the following: any coatings on metal being welded (e.g., paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality of ventilation, the position of the welder's head with respect to the fume plume, and the presence of other contaminants in the atmosphere. When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2 (Composition and Information on Ingredients). Fume and gas decomposition products, and not the ingredients in the electrode, are important. Concentration of the given fume or gas component may decrease or increase by many times the original concentration. New compounds in the electrode may form. Decomposition products of normal operations include not only those originating from volatilization, reaction, or oxidation of the product's components but also those from base metals and any coating (as noted previously). The best method to determine the actual composition of generated fumes and gases is to take an air sample from inside the welder's helmet if worn or in breathing zone. For additional information, refer to the American Welding Society Publication, "Fumes and Gases in the Welding Environment".

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids, strong oxidizers, mineral acids, and halogens.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Uncontrolled exposure to extreme temperatures, incompatible materials.

SECTION 12: ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of these products occur naturally in the environment and are expected to persist in the environment for an extended period of time. Iron will react with water and air to form a variety of stable iron oxides.

EFFECT OF MATERIAL ON PLANTS OR ANIMALS: The components of these products occur naturally in the environment and are essential for plant and animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: These products are not expected to cause adverse effects.

COPPER: Copper is concentrated by plankton by 1000 or more. Copper may concentrate to toxic level in the food chain.

SECTION 13: DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. These products, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: Not applicable to wastes consisting of only this product.

****NOTE**** Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary, all waste must be disposed/recycled/re-claimed in accordance with federal, state, and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

THIS MATERIAL IS NOT HAZARDOUS (Per 49 CFR 172.101) BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not Applicable

HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable

UNIDENTIFICATION NUMBER: Not Applicable

PACKING GROUP: Not Applicable

DOT LABEL(S) REQUIRED: Not Applicable

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER, 2000: Not Applicable

MARINE POLLUTANT: No component of this product is designated as a marine pollutant by the Department of Transportation (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is not considered as dangerous goods, per regulations of Transport Canada.

SECTION 15: REGULATORY INFORMATION

COMPONENT	SARA 302	SARA 304	SARA 313
Aluminum (fume or dust)	No	No	Yes
Copper	No	Yes	Yes
Manganese	No	No	Yes

SARA THRESHOLD PLANNING QUANTITY: Not applicable.

TSCA INVENTORY STATUS: The components of these products are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Copper = 5000 lbs. (for particulates less than 100 micrometers in size).

OTHER FEDERAL REGULATIONS: Not applicable.

US STATE REGULATORY INFORMATION: The components of these products are covered under specific State regulations, as denoted below:

CANADIAN REGULATIONS

"This product has been classified in accordance with the hazard criteria of the **Controlled Products Regulations** and the MSDS contains all the information required by the **Controlled Products Regulations**."

DLS/NDSL-WHMIS: Uncontrolled Product

Alaska-Designated Toxic and Hazardous Substances: Aluminum Welding Fumes, Carbon Black, Manganese, and Molybdenum.	Missouri-Employer Information Toxic Substance List: Aluminum, Carbon Black, Copper, Manganese, Molybdenum, Silicon, and Zirconium.
California-Permissible Exposure Limits for Chemical Contaminants: Aluminum, Carbon Black, Copper, Manganese and Silicon.	New Jersey-Right to Know Hazardous Substance List: Aluminum, Carbon Black, Copper, Manganese, Molybdenum, Titanium, and Zirconium.
Florida-Substance List: Aluminum, Manganese, Molybdenum, and Zirconium.	North Dakota-List of Hazardous Chemicals, Reportable Quantities: Copper
Illinois-Toxic Substance List: Aluminum, Carbon Black, Copper, Manganese, Molybdenum, and Silicon.	Pennsylvania-Hazardous Substance List: Aluminum, Carbon Black, Copper, Manganese, Molybdenum, Silicon, and Zirconium.
Kansas-Section 302/313 List: Aluminum, Copper, and Manganese.	Rhode Island-Hazardous Substance List: Aluminum Welding Fumes, Carbon Black, Manganese, Molybdenum, Silicon, and Zirconium.
Massachusetts-Substance List: Aluminum, Carbon Black, Copper, Manganese, Molybdenum, and Zirconium.	Texas-Hazardous Substance List: Carbon Black, Manganese, and Molybdenum.
Michigan-Critical Materials Register: Copper	West Virginia-Hazardous Substance List: Carbon Black, Manganese, and Molybdenum.
Minnesota-List of Hazardous Substances: Aluminum Welding Fumes, Carbon Black, Manganese, and Silicon.	Wisconsin-Toxic and Hazardous Substances: Carbon Black, Manganese, and Molybdenum.

CALIFORNIA PROPOSITION 65: No component of these products is on the California Proposition 65 List. **WARNING:** This product may contain chemicals, and when used for welding may produce fumes or gases containing chemicals, known to the State of California to cause cancer, and/or birth defects (or other reproductive harm.)

SECTION 16: OTHER INFORMATION

REVISIONS

Revision Number: 2

PREPARATION INFORMATION

Prepared By: Wolverine Joining Technologies, and Wolverine Tube Inc.
Corporate Environmental, Health and Safety Group.

Phone Number/Address: See Section 1

This Material Data Sheet is offered pursuant to OSHA's Hazard Communication Standard (29 CFR 1910.1200). Other government regulations must be reviewed for applicability to these products. The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling these products. The information presented in the MSDS is premised upon proper handling and anticipated uses and is for the material without chemical additions/alterations. We believe this information to be reliable and up-to-date as of the date of publication, but make no warranty that it is. Additionally, if this Material Safety Data Sheet is more than three years old, please contact the supplier at the phone number listed in Section 1 to make certain that this sheet is the most current. Copyright Wolverine Joining Technologies, LLC. License granted to make unlimited copies for internal use only.