



Safety Data Sheet

1. Supplier and Manufacturer

Aufhauser Corporation
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Emergency Phone Number: 516-694-8696 or 212-246-0205
CHEMTREC 24-hour Emergency Response: 800-424-9300 or 703-527-3887
SDS Number: SSBER 201606

Product Codes: **Stainless Steel Bare Rods: ER209, ER218, ER219, ER240, ER307, ER308, ER308H, ER308L, ER308LMo, ER308Si, ER308LSi, ER309, ER309L, ER309Mo, ER309LMo, ER309Si, ER309LSi, ER310, ER312, ER316, ER316H, ER316L, ER316Si, ER316LSi, ER317, ER317L, ER318, ER320, ER320LR, ER321, ER330, ER347, ER347Si, ER383, ER385, ER409, ER409Cb, ER410, ER410NiMo, ER420, ER430, ER446LMo, ER502, ER505, ER630, ER19-H, ER16-8-2, ER2209, ER2553, ER3556**

Product Use(s): Metal welding



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OF THIS DOCUMENT

2. Hazards identification

Classification(s)

GHS Classified: Acute Tox 4 (Oral): H302; Skin Sens 1: H317; Carc 1B: H350, STOT RE 1: H372; Aquatic Acute 1: H400, Aquatic Chronic 3: H412

GHS Label Symbol(s): Health, Exclamation, Environment



GHS Label Signal Word(s): Danger

GHS Label Hazard Statement(s): Harmful if swallowed. May cause an allergic skin reaction. May cause cancer. Causes damage to organs through prolonged or repeated exposure. Very toxic to aquatic life. Harmful to aquatic life with long lasting effects.

GHS Precautionary statements: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/ fume/ gas/ mist/ vapors/ spray. Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/ protective clothing/ eye protection/ face protection. IF SWALLOWED: call poison center or doctor/physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. If exposed or concerned: Get medical advice/attention. Get medical advice and attention if you feel unwell. Specific treatment (see label). If swallowed, rinse mouth. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Collect spillage. Store locked up. Dispose of contents/ container in accordance with local/ regional/ national/ international regulations.

Label Precautionary Statement(s):

WARNING: PROTECT yourself and others. Read and understand this information.
FUMES AND GASES can be hazardous to your health.
ARC RAYS can injure your eyes and burn skin. ELECTRIC SHOCK can kill.

- Before Use, read and understand the manufacturer's instructions. Safety Data Sheets (SDSs), and your employer's safety policies.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area.
- Wear correct eye, ear, and body protection.

Other Hazards: These products consist of solid metal rods or electrodes that are odorless. There are no immediate health hazards associated with these products. Nickel and Chromium components of some of these products are suspect carcinogens. These products are not flammable nor reactive. If involved in a fire, these products may generate irritating iron fumes, a variety of iron

compounds, carbon dioxide, carbon monoxide, and metal oxides. Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

3. Composition/information on ingredients

Note: The percentage by weight values for the ingredients in this product represent approximate formulation values.

Ingredient	CAS #	% wt	GHS note
Carbon	7440-44-0	0.01 - 0.2	
Chromium	7440-47-3	5 - 32	
Copper	7440-50-8	0.7 - 4	Aquatic Acute 1: H400
Iron	7439-89-6	45 - 80	Acute Tox 4 (oral): H302
Manganese	7439-96-5	0.05 - 14	
Molybdenum	7439-98-7	0.45 - 5	
Nickel	7440-02-0	0.5 - 36	Skin Sens 1: H317; Carc 1B: H350; STOT RE 1: H372
Niobium	7440-03-1	0.05 - 1	
Phosphorus	7723-14-0	0 - 0.3	
Silicon	7440-21-3	0.1 - 1	
Sulfur	7704-34-9	0 - 0.3	

4. First aid measures

Description of First Aid Measures

Inhalation: Remove victim to fresh air. If necessary, use artificial respiration to support vital functions.

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: 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.

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.

Note to Physician: Treat symptoms and eliminate overexposure.

Most Important Symptoms and Effects Both Acute and Delayed

General: Welding, cutting, or processing this material may release dust or fumes that are hazardous. During processing, inhalation of fumes may cause dizziness and/or irritation to the eyes, nose, and throat. Hot molten product will cause thermal burns to the skin.

Inhalation: Short-term (acute) overexposure to gases, fumes, and dusts may include irritation of the eyes, lungs, nose, and throat. Some toxic gases may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as water eyes, nose and throat irritation, headache, dizziness, difficulty in breath, 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 reactions. Excessive inhalation or ingestion of manganese can produce manganese poisoning. Overexposure to manganese compounds may affect the central nervous system, symptoms of which are languor, sleepiness, muscular weakness, emotional disturbances, and spastic gait resembling Parkinsonism. These symptoms can become progressive and permanent if not treated. Excessive inhalation of fumes may cause "Metal Fume Fever" with flu-like symptoms such as chills, fever, body aches, vomiting, sweating.

Skin Contact: May cause irritation. Contact with hot, molten metal will cause thermal burns.

Eye Contact: Fumes from thermal decomposition may cause eye irritation. Risk of thermal burns on contact with molten product. Arc rays and sparks can burn eyes.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label/SDS at hand.

5. Firefighting measures

Extinguishing Media

Suitable Extinguishing Media: Use extinguishing agents appropriate for surrounding materials.

Unsuitable Extinguishing Media: None

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable.

Explosion Hazard: Product is not explosive. Ensure proper welding procedures to avoid welding explosions.

Reactivity: None under normal conditions. Metallic dusts may ignite or explode.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not breathe fumes from fires or vapors from decomposition.

Protection During Firefighting: Use proper protective equipment, including respiratory protection.

Hazardous Combustion Products: This product may decompose and produce iron fumes, a variety of nickel, iron, copper and a variety of metal compounds and metal oxides. The hot material can present a significant thermal hazard to firefighters.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: No additional information available.

For Non-Emergency Personnel

Protective Equipment: No additional information available.

Emergency Procedures: No additional information available.

For Emergency Personnel

Protective Equipment: No additional information available.

Emergency Procedures: No additional information available.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: No special requirements.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Avoid generation of dust during clean-up of spills. Ventilate area. Do not mix with other materials. Transfer spilled material to a suitable container for recycling or appropriate disposal.

7. Handling and storage

Precautions for Safe Handling

Use proper ventilation and respiration apparatus; eye, hand, and body protection as necessary.

Additional Hazards When Processed: Risk of electric shock when welding. Arc rays and sparks can burn skin. See ANSI Z49.1-1967 Safety in Welding and Cutting published by the American Welding Society and OSHA Hazard Communication Standard 1910.1200 for additional details regarding the handling and storage of this material.

Precautions for Safe Handling: Use appropriate personal protective equipment when handling and observe good personal hygiene measures after handling.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible Materials: See section 10.

8. Exposure controls/personal protection.

Ingredients – Exposure Limits

Ingredient	CAS #	ACGIH TLV (mg/m3)	OSHA PEL (mg/m3)	Carc.
Carbon	7440-44-0	10 (inhale), 3 (resp)	15 (total dust), 5 (resp)	
Chromium	7440-47-3	0.5	1	IARC 3, A4
Copper	7440-50-8	0.2 (fume), 1 (total dust)	0.1 (fume), 1 (total dust)	EPA: D
Iron	7439-89-6	5 (fume)	10 (fume)	A4
Manganese	7439-96-5	0.02 (resp)	5 (fume ceiling)	
Molybdenum	7439-98-7	3 (resp)	15 (total dust)	
Nickel	7440-02-0	0.1	0.1	IARC 2B, EPA: A
Niobium	7440-03-1	ne	ne	
Phosphorus	7723-14-0	0.1	0.1	EPA: D
Silicon	7440-21-3	10 (total dust)	15 (total dust), 5 (resp)	
Sulfur	7704-34-9	ne	ne	

Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. All equipment should comply with the National Electric Code. When cutting, grinding, crushing, or drilling, provide general or local ventilation systems, as needed, to maintain airborne dust concentrations below the regulatory limits. Local vacuum collection is preferred since it prevents release of contaminants into the work area by controlling it at the source. Other technologies that may aid in controlling airborne respirable dust include wet suppression, ventilation, process enclosure, and enclosed employee work stations. Prevent dust accumulation.

Personal Protective Equipment: Gloves. Protective clothing. Face shield. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: With molten material wear thermally protective clothing.

Hand Protection: Appropriate welding or heat resistant gloves.

Eye Protection: Welders should wear goggles or safety glasses with side shields that comply with ANSI Z87.1 under welding helmets and always wear goggles or other suitable eye protection when gas welding or oxygen cutting.

Skin and Body Protection: Wear fire/flammable resistant/retardant clothing appropriate for task.

Respiratory Protection: Wear approved respiratory apparatus appropriate for task.

Consumer Exposure Controls: Do not eat, drink or smoke during use.

9. Physical and chemical properties

Physical state: Solid	Appearance: metallic rod or wire
Odor: none	Odor threshold: n/a
pH: n/a	Evaporation rate (nBuAc = 1): 1.5
Melting point: 1535 C (2795 F)	Freezing point: n/a
Boiling point (@ 24 mm Hg): 3000 C (5432 F)	Flash point: n/a
Auto-ignition temperature: n/a	Decomposition temperature: n/a
Flammability (solid, gas): n/a	Lower flammable limit: n/a
Upper flammable limit: n/a	Vapor pressure: n/a
Relative vapor density at 20C: n/a	Relative density: n/a
Specific gravity @ 20C (water = 1): 7.87	Solubility in water: Insoluble
Partition coefficient (N-octanol/water): n/a	Viscosity: n/a
Explosion - sensitivity to mechanical impact: not expected to present an explosion hazard due to mechanical impact	Explosion - sensitivity to static discharge: not expected to present an explosion hazard due to static discharge

10. Stability and reactivity

Products as shipped are non-hazardous, nonflammable, non-explosive, and nonreactive.

Reactivity: None under normal conditions.

Chemical Stability: Stable under normal conditions.

Possibility of Hazardous Reactions: Will not occur.

Conditions to Avoid: Incompatible materials. Uncontrolled exposure to extreme temperatures.

Incompatible Materials: Strong acids. Strong oxidizers. Mineral acids. Halogens.

Hazardous Decomposition Products: Metal oxides. Iron compounds. Fume constituents may include: complex oxides or iron, manganese, silicon, chromium, nickel, columbium, molybdenum, copper, carbon dioxide, carbon monoxide, ozone and nitrogen oxides. Certain products may also include: antimony, barium, molybdenum, aluminum, columbium, magnesium, strontium, tungsten, zirconium, or zinc oxides. Fume limits for individual components may be reached before limit of 5 mg/m³ of general welding fumes is reached. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

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".

11. Toxicological information

Information on Toxicological Effects - Product

Acute Toxicity: Harmful if swallowed	LD50 and LC50 Data: Not available
Skin Corrosion/Irritation: Not classified	Serious Eye Damage/Irritation: Not classified
Respiratory or Skin Sensitization: Not classified	Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available	Carcinogenicity: Not classified.

Specific Target Organ Toxicity (Repeated Exposure): Not classified	Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified.	Aspiration Hazard: Not classified

Irritancy of product: Dusts or fumes of these products may be irritating to contaminated skin and eyes. Fumes may be irritating to the respiratory system.

Sensitization to the product: These products are not known to be skin or respiratory sensitizers.

Reproductive toxicity information: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: These components are not reported to produce mutagenic effects in humans. Animal mutation data are available for the, Chromium (III) Oxide, Molybdenum, Nickel, components of these products.

Embryotoxicity: These products are not reported to produce embryotoxic effects in humans.

Teratogenicity: These components are not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Copper, Molybdenum, and Nickel components of these products indicate teratogenic effects.

Reproductive Toxicity: These components are not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Copper, Molybdenum and Phosphorus components of these products indicate adverse reproductive effects

Biological exposure indices: Not available.

Information on Toxicological Effects - Ingredient(s)

Iron	TDLo (oral, child) = 77 mg/kg; brain, gastrointestinal tract, blood effects
Manganese	TCLo (inhalation, man) = 2300 µg/m ³ ; brain, central nervous system effects
Carbon Steel Electrode	ATE (oral) 500 mg/kg
Silicon	ATE (oral) 3160 mg/kg
Phosphorus (yellow)	LDLo (oral, woman) = 22 mg/kg; cardiovascular effects TDLo (oral, woman) = 11 mg/kg LDLo (oral, woman) = 1400 µg/kg LDLo (oral, woman) = 4600 µg/kg; pulmonary system, gastrointestinal tract, skin effects TDLo (oral, woman) = 2600 µg/kg
Sulfur	Eye irritancy (human) = 8 ppm
Copper	TDLo (oral, human) = 1200 µg/kg; gastrointestinal tract effects

Suspected Cancer Agents: The components of this product are listed as follow:

Iron (as Iron Oxide)	ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen; agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of lack of data), IARC-3 (Unclassifiable as to Carcinogenicity in Humans)
Manganese	EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available)
Copper	EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available)
Chromium	IARC-3 (Unclassifiable as to Carcinogenicity in Humans), ACGIH-A4 (Not Classifiable as a Human Carcinogen; agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of lack of data)
Phosphorus	EPA-D (Not Classifiable as to Human Carcinogenicity (inadequate human and animal evidence of carcinogenicity or no data available)
Nickel	IARC-2B (Possibly Carcinogenic to Humans), ACGIH-A5 (Not suspected as a Human Carcinogen), NTP-R (Reasonably Anticipated to be a Human Carcinogen).

Other components of these products that are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

12. Ecological information

Toxicity: Very toxic to aquatic life.

Manganese	NOEC chronic fish: 3.6 mg/L (Exposure time: 96h - Species: Oncorhynchus mykiss)
Iron	LC50 Fish: 0.56 mg/L (96h - Cyprinus carpio)
Nickel	LC50 Fish 1: >100 mg/L (96h - Brachydanio rerio) EC50 Daphnia 1: >100 mg/L (48h - Daphnia magna) EC50 other aquatic organisms 1: 0.18 mg/L (72h - Pseudokirchneriella subcapitata) LC50 Fish 2: 1.3 mg/L (96h - Cyprinus carpio [semi-static]) EC50 Daphnia 2: 1 mg/L (48h - Daphnia magna [static]) EC50 other aquatic organisms 2: 0.174- 0.311 mg/L (96h - Pseudokirchneriella subcapitata [static])
Copper	LC50 Fish 1: 0.0068-0.0156 mg/L (96h - Pimephales promelas) EC50 Daphnia 1: 0.03 mg/L (48h - Daphnia magna [static]) EC50 other aquatic organisms 1: 0.0426 - 0.0535 mg/L (72h - Pseudokirchneriella subcapitata [static]) LC50 Fish 2: <0.3 mg/L (96h - Pimephales promelas [static]) EC50 other aquatic organisms 2: 0.031 - 0.054 mg/L (96h - Pseudokirchneriella subcapitata [static])

Persistence and Degradability: The components of these products are expected to persist in the environment for an extended period of time.

Environmental Stability: Iron, the main component of these products will react with water and air to form a variety of stable iron oxides.

Bioaccumulative: No additional information available.

Mobility in Soil: No additional information available.

Other Adverse Effects: No additional information available.

13. Disposal considerations

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Recycle where possible and/or dispose of spent material such as metals & metal-bearing waste and submerged arc welding (SAW) flux/slag appropriately.

EPA Waste Number: D007 (Chromium) 5.0 mg/L (regulated level).

14. Transport information

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

Transport is not regulated in accordance with: USDOT, TDG (Canada), IATA, or IMDG.

UN Identification Number: Not Applicable

15. Regulatory information

	US Federal Regulations	Canadian
Silicon	Listed on the United States TSCA (Toxic Substances Control Act) inventory	Listed on the Canadian DSL (Domestic Substances List) WHMIS Classification: Uncontrolled product according to WHMIS classification criteria
Manganese	Listed on the United States TSCA (Toxic Substances Control Act) inventory; Listed on United States SARA Section 313 SARA Section 313 - Emission Reporting: 1.0%	Listed on the Canadian DSL (Domestic Substances List); Listed on the Canadian IDL (Ingredient Disclosure List) IDL Concentration 1 % WHMIS Classification: Uncontrolled product according to WHMIS classification criteria
Iron	Listed on United States TSCA (Toxic Substances Control Act) inventory	WHMIS Class B-4
Copper	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - Emis. 1.0% SARA Section 304 (40 CFR Table 302.4)	Listed on the Canadian DSL (Domestic Substances List)
Chromium	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - Emis. 1.0% SARA Section 304 (40 CFR Table 302.4)	Listed on the Canadian DSL (Domestic Substances List)
Nickel	Listed on United States TSCA (Toxic Substances Control Act) inventory SARA Section 313 (40 CFR 372.65) - Emis. 0.1% SARA Section 304 (40 CFR Table 302.4)	Listed on the Canadian DSL (Domestic Substances List)
Molybdenum	Listed on United States TSCA (Toxic Substances Control Act) inventory	
Niobium	Listed on United States TSCA (Toxic Substances Control Act) inventory	

State Regulatory Information:

Some components are listed.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains information required by CPR.

WARNING: This product may contain chemicals, and when used for welding or brazing may produce fumes or gases containing chemicals known to the state of California to cause cancer, and/or birth defects (or other reproductive harm).

Proposition 65 (California):

- Chemicals known to cause cancer: Nickel
- Chemicals known to cause reproductive toxicity for females: none
- Chemicals known to cause reproductive toxicity for males: none
- Chemicals known to cause developmental toxicity: none

16. Other information including information on preparation and revision of the SDS

<p><u>NFPA Health Hazard:</u> 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given</p> <p><u>NFPA Fire Hazard:</u> 0 - Materials that will not burn</p> <p><u>NFPA Reactivity:</u> 0 - Normally stable, even under fire exposure conditions, and are not reactive with water</p>	<p><u>HMIS III Rating</u></p> <p><u>Health:</u> 2 Moderate Hazard - Temporary or minor injury may occur</p> <p><u>Flammability:</u> 0 Minimal Hazard</p> <p><u>Physical:</u> 0 Minimal Hazard</p>
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Disclaimer

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Aufhauser Corporation