

# SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

**MATERIAL IDENTITY:**

Steel  
 Carbon and low alloy steels; 10XX, 11XX, 12XX, 40XX, 41XX, 46XX, 50XX, 51XX, 52100, 6151, 81XX, 86XX, 87XX, 92XX and others

**INFORMATION TELEPHONE:**

INFORMATION: (262) 268-2400

**EMERGENCY TELEPHONE:**

EMERGENCY: (262) 268-2330

CHEMTREC: (800) 424-9300

**COMPANY:**

Charter Steel  
 1658 Cold Springs Drive  
 Saukville, WI 53080

Synonyms: Steel, steel rod, steel bar, steel wire

Chemical Family: Inorganic Compounds

Molecular Wt: Varies with metal

Molecular Formula: Varies with metal

## 2. HAZARDS IDENTIFICATION

**General Hazard Statement:** Steel rod, wire and bars in the final manufactured state do not present inhalation, ingestion, or contact hazards. However, some hazardous elements contained in these products can be emitted under certain processing conditions such as burning, cutting, sawing, grinding, machining and welding. The following classification information is for the hazardous elements that might be released during processing.

Molten or finely divided particles, chips, fines, dust may ignite readily and may pose an explosion hazard in contact with water or other liquids.

**EMERGENCY OVERVIEW**

**OSHA HAZARDOUS**

Target Organ

- Eye
- Skin
- Respiratory
- Kidney, Respiratory, Skin

Target Organ Effect:

- Irritant
- Irritant/Sensitizer
- Irritant/Sensitizer
- Target Organ Effect

**GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS**

Health		Environmental	Physical
Acute Toxicity, Oral	Category 2	Acute Aquatic Toxicity Category 1	Not Classified
Skin Irritant	Category 2	Chronic Aquatic Toxicity Category 1	
Serious Eye Irritant	Category 2B		
Respiratory Sensitization	Category 1		
Carcinogenicity	Category 2		
Reproductive	Category 1B		
Target Organ Toxicity (kidney, respiratory, skin)	Category 1		

Pictogram:



Signal Word

**Danger**

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Hazard Statements	Precautionary Statements
H303 Maybe harmful if swallowed	P281 Wear protective gloves/protective clothing/eye protection/face protection P260 Do not breath dust/fume/gas/mist/vapors/spray P285 In case of inadequate ventilation wear respiratory protection P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P273 Avoid release to the environment
H315 Causes skin irritation	
H320 Causes eye irritation	
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled	
H317 May cause an allergic skin reaction	
H341 Suspected of genetic defects	
H351 Suspected of causing cancer	
H370 Causes damage to organs (kidneys, respiratory)	
H401 Toxic to Aquatic Life	

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical Characterization:**

Ingredient(s)	CAS Number	% (by weight)
Iron	7439-89-6	90 - 99
Silicon	7440-21-3	< 2.5
Manganese	7439-96-5	< 2.0
Nickel	7440-02-0	< 2.0
Carbon	1333-86-4	< 1.1
Chromium	7440-47-3	< 1.5
Molybdenum	7439-98-7	< 0.7
Other trace elements < 1% by weight may include aluminum, boron, calcium, cobalt, copper, lead, phosphorus, sulfur, tin, titanium, vanadium and zirconium.		

### 4. FIRST AID MEASURES

Steel rod, wire and bars in the final manufactured state do not present inhalation, ingestion, or contact hazards. The following recommendations are for overexposure to welding fume and other particulate released during processing.

**Eyes Contact:** Dust may cause irritation. Immediately flush eyes gently with large amounts of water for at least 15 minutes. Retract eyelids often. Check for and remove any contact lenses. Get medical aid.

**Skin Contact:** Dust may cause irritation. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

**Ingestion:** Not expected to occur. If dust is ingested may cause damage to the digestive tract. May cause liver damage. This material may contain traces of lead compounds that can effect kidneys and the central nervous system. DO NOT induce vomiting. If victim is conscious and alert, give 2 - 4 cupfuls of milk or water. Get medical attention.

**Inhalation:** Dust is irritating to the respiratory tract. Exposure to fume and particulate may produce irritation of the eyes and respiratory system. Inhalation of high concentrations of freshly formed oxides of the metals iron, manganese or copper may cause metal fume fever characterized by metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms. This material may contain trace concentrations of nickel, chromium and lead that may be released during processing. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Chronic inhalation:** Long term exposure to high concentrations of the heavy metals from burning or mechanical action on this product may cause the following chronic effects: iron oxide fume may cause benign siderosis (a pneumoconiosis); iron oxide may increase the risk of lung cancer development when also exposed to pulmonary carcinogens. Manganese may affect the central nervous system, causing sleepiness,

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languor, weakness in the legs, psychological or neurological and psychomotor effects; manganese may also cause reduced fertility in males. Silicon is an upper respiratory tract and skin irritant. Carbon is a skin, eye and respiratory tract irritant. Nickel is an irritant and sensitizer of the skin and respiratory tract. Some compounds of nickel cause cancer. Molybdenum particulate affects the eyes and respiratory system and may also damage the liver and kidneys.

Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Carcinogenicity:** This material may contain trace concentrations of components that have been listed as carcinogens by ACGIH, IARC, NTP or CA Prop 65 including lead, nickel and chromium.

**Advise to physicians:** Symptoms of exposure to fume and other particulate from burning or mechanical action on steel include irritation of skin, eyes and throat; central nervous system effects such as sleepiness, languor, psychological and psychomotor effects; metal fume fever, cough, tightness in chest, weakness, fatigue, insomnia, GI distress, kidney, liver or cardiovascular system disease. Treat symptomatically and supportively.

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## 5. FIRE FIGHTING MEASURES

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### Conditions of Flammability

Not flammable or combustible as shipped. Small chips, fines, and dust from processing may be readily ignitable.

### Suitable extinguishing media

Use Class D agent to extinguish a particulate fire, of small chips and fines. DO NOT use halogenated extinguishing media. DO NOT use water on fires involving ignited particulate or molten metal. These extinguishing agents may react with burning metal resulting in an explosion.

### Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating gases and vapors (See Section 10). In the event of fire and/or explosion do not breath fumes. May cause sensitization by inhalation and skin contact.

### Fire Fighting Instructions

Do not enter fire area without proper protection. Wear self contained breathing apparatus (pressure-demand MSHA/NIOSH) approved or equivalent. See Section 10 - decomposition products possible. Fight fire from safe distance/protected location. Heat/impurities may increase temperature/build pressure/rupture closed containers, spreading fire, increasing risk of burns/injuries. Use water spray/fog for cooling.

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## 6. ACCIDENTAL RELEASE MEASURES

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### Personal Precautions

Steel in formed state (billets, bars, rods, wire) is not expected to pose a release hazard.

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

### Environmental Precautions

Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers. Notify authorities of any releases to sewers, soils, waterways or air.

### Methods and Materials for Containment and Cleaning Up

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Avoid dust formation. Collect scrap for recycling. If product is molten contain the flow using dry sand or salt flux as a dam. All tools and container which come into contact with molten metal must be preheated for specially coated and rust free. Allow spill to cool before remelting as scrap.

See section 1 for emergency contact information and section 13 for waste disposal.

## 7. HANDLING AND STORAGE

### Precautions for Safe Handling

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid contact with sharp edges or heated material.

### Conditions for Safe Storage

Store away from acids and calcium hypochlorite

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE LIMITS

HAZARDOUS COMPONENT	PEL		TLV	Other
Iron 7439-89-6	10 mg/m <sup>3</sup>	fume	5 mg/m <sup>3</sup>	respirable
Silicon 7440-21-3	10 mg/m <sup>3</sup>	fume	5 mg/m <sup>3</sup>	respirable
Manganese 7439-96-5	1 mg/m <sup>3</sup> fume	3mg/m <sup>3</sup> STEL fume	0.2 mg/m <sup>3</sup> ACGIH	
Nickel 7440-02-0	1 mg/m <sup>3</sup>		1.5 mg/m <sup>3</sup> ACGIH	inhalable
Chromium 7440-47-3	1 mg/m <sup>3</sup>		0.5 mg/m <sup>3</sup> ACGIH	
Carbon 1333-86-4	3.5 mg/m <sup>3</sup>		3.5 mg/m <sup>3</sup>	
Molybdenum 7439-98-7	15 mg/m <sup>3</sup>	Total Particulate	3 mg/m <sup>3</sup>	respirable

### Engineering Controls

Steel billets, rods, bars and wire in their final manufactured state do not present inhalation, ingestion, or contact hazards. However, operations such as welding, burning, flame or laser cutting, brazing, grinding, sanding or sawing may release fume and other particulate, which should be captured with adequate local exhaust ventilation such as a fume extractor or vented down draft table. Mechanical exhaust ventilation is mandatory for welding and thermal cutting of carbon steel in confined spaces. Mechanical exhaust ventilation is also strongly recommended if the carbon steel surface is galvanized or coated since there may be toxic fumes from heat breakdown of the coatings. OSHA ventilation and work practice requirements for welding are in 29 CFR 1910.252.

### Respiratory Protections

No respiratory protection is needed unless processing releases fume or particulate. Where exposures cannot be adequately controlled through exhaust ventilation provide respiratory protection in accordance with OSHA and NIOSH recommendations. Minimum respiratory protection would include half-face piece air purifying or PAPR with NPR-95 filter or supplied air in continuous mode.

### Eye Protection

Goggles or safety glasses with side shields and face shields should be used for protection against flying particulate and fume during steel processing. Provide appropriate welding helmet with eye protection during welding.

### Skin and Body Protection

Protective clothing including long sleeves and long pants of nonflammable insulating material is recommended for protection during steel processing. Sturdy cut-resistant gloves should be worn when

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handling solid materials. Provide welding gloves, aprons or jackets, and other skin protection when welding, cutting, brazing or banding.

## Other hygienic practices

Hands and face should be washed before eating or smoking. Fume and other particulate should be removed from clothing by HEPA vacuuming. Compressed air **MUST NOT** be used for particulate removal. Contaminated clothing should not be worn off the job site.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Appearance

Form	Solid
Color	Grey or grey black
pH	Not applicable
Melting/Freezing Temperature	> 2,500 °F
Boiling Point	> 5,400 °F
Flash Point	Nonflammable
Ignition Temperature	Not applicable
Autoignition Temperature	Not applicable
Lower explosive limit: Not applicable	Upper explosive limit: Not applicable
Vapor Pressure	Not applicable
Vapor Density (air=1)	Not applicable
Specific Gravity (water=1 @39.2F)	7.84 @ 609 °F
Evaporation Rate (Bac=1)	Not applicable
Solubility	Not applicable
Odor	Odorless
Odor threshold	Not applicable
Percent Volatile	Not applicable

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## 10. STABILITY AND REACTIVITY

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### Chemical Stability

Stable

### Possibility of Hazardous Reactions

Will not occur

### Conditions to Avoid

Dust formation generates hydrogen on contact with acids.

### Materials to Avoid

Liberates hydrogen on contact with acids. Avoid contact with acids, alkalis, water.

### Hazardous Decomposition Products

Hazardous decomposition products can include hazardous metallic dust (particulate) fume may be generated from welding, brazing, cutting, burning, grinding, sanding, sawing and machining.

Toxic metal oxides and carbon and nitrogen oxides may be produced during a fire involving metal alloys. Alloys with nickel may also produce poisonous nickel carbonyl.

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## 11. TOXICOLOGY INFORMATION

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### Toxicity Data

#### Acute Toxicity

Iron	(7439-89-6)	Oral LD50	Rat	984 mg/kg
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Silicon	(7440-21-3)	Oral LD50	Rat	3,160 mg/kg
Manganese	(7439-96-5)	Oral LD50	Rat	9 g/kg
Nickel	(7440-02-0)	Oral LD50	Rat	9,000 mg/kg
Chromium	(7440-47-3)	Oral LD50	Rat	80 mg/kg

## Skin Irritation/Sensitizer

Skin

Irritant/Sensitizer May cause allergic reaction.

## Serious Eye Irritation

Eye

Irritant

## Respiratory

Respiratory

Irritant/Sensitizer Inhalation may cause metal fume fever see section 4.

## Mutagenicity

Some components are suspected of causing genetic defects.

## Carcinogenicity

This material may contains trace concentrations of components that have been listed as carcinogens by ACGIH, IARC, NTP or CA Prop 65 including lead, nickel and chromium.

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## 12. ECOLOGICAL INFORMATION

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Steel in a solid state does not present an ecological hazard. The following represents toxicity of components if released as a fume or dust.

### Aquatic Ecotoxicity

Iron	(7439-89-6)	Semi static LC50 Fish	> 0.56 mg/l
Silicon	(7440-21-3)	Semi static LC50 Fish	1.3 mg/l
Nickel	(7440-02-0)	96 hour LC50 Fish	0.4 mg/l

### Biodegradability

Persistent. Not readily biodegradable - Metal powders may cause ecological damage through silting or sediment effects.

### Mobility in soil

Metal powder is immobile in soils but may be transported with ground water.

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## 13. DISPOSAL CONSIDERATIONS

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### Waste Disposal

When recycled steel is not regulated. When disposed it is not a RCRA (Resource Conservation and Recovery Act) hazardous waste. Dispose of per local, state and federal requirements.

**Exception:** Steel Swarf (ferrous metal borings, powder, dust, cuttings, shavings, turnings, etc.) is ignitable and has the EPA Hazardous Waste Number of D001. Recycle or remove to a waste facility in compliance with local, state and federal regulations.

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## 14. TRANSPORTATION INFORMATION

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### DOT (US)

Steel rods, wires and bars in their final manufactured state are not a U.S. Department of Transportation (DOT) regulated hazardous material requiring labeling or a placard.

Exception: Steel SWARF is a DOT regulated material

Hazard Class:	4.2
Identification No.	UN2793
PG:	III
Packing:	No exceptions 213, 241
Placard:	SPONTANEOUS COMBUSTIBLE

### IMDG

Not Regulated

### TDG

Not Regulated

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## 15. REGULATORY INFORMATION

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### TSCA INVENTORY STATUS

TSCA: All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

### OSHA HAZARDS

Solid metallic products are classified as "articles and do not constitute an OSHA hazardous material in a solid form.

OSHA Standards for General Industry (29 CFR 1910), Shipyard Standard (29 CFR 1915), and Construction Standards (29 CFR 1926) apply to processing of these.

HMIS Classification		NFPA Rating	
Health Hazard;	0		0
Flammability	0		0
Physical Hazards	0		0

### SARA TITLE III: Section 311/312 Hazard Class

Solid metallic products are classified as "articles and are not subject to Section 311 and Section 312.

### SARA TITLE III: Section 313 (40CFR370)

This product contains the following materials at or above the de minimus concentrations that may be subject to SARA Section 313 Reporting: Chromium, Manganese, Nickel.

### CERCLA Information (40CFR302.4)

This material contains chromium and nickel at or above the de minimus concentrations as defined by CERCLA or SARA Title III.

### Clean Air Act

Manganese, Nickel, Chromium

### CLEAN WATER ACT

Chromium, Nickel

### California Proposition 65 Information:

This material may contains trace concentrations of components that have been listed as carcinogens by ACGIH, IARC, NTP or CA Prop 65 including lead, nickel and chromium.

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**16. OTHER INFORMATION**

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Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. The information in this MSDS was obtained from sources, which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable. This MSDS has been prepared in accordance with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200).