

# Material Safety Data Sheet

Product Name or Code: Steel

Company Name: Charter Steel

## Section 1: Product and Company Information

Supplier Name and Address: Charter Steel  
1658 Cold Springs Drive  
Saukville, Wisconsin 53080

Emergency Phone Number: (800) 424-9300 (Chemtrec)  
Information Phone Number: (262) 268-2334

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

Product Information: Carbon and low alloy steels; 10XX, 40XX, 41XX  
46XX, 50XX, 51XX, 52100, 6151, 81XX, 86XX,  
87XX, 92XX and others

Issue Date: June 1, 2007

## Section 2: Hazards Identification

### EMERGENCY OVERVIEW

Appearance/ Odor: Grey or grey-black solid, odorless metal. May be billets, rods, bars or wire.

Steel rods, bars or wire in their final manufactured state do not pose health, fire or environmental hazards.

Operations such as welding, burning, flame or laser cutting, brazing, grinding, sanding, and sawing may release fume and other particulate (metal dust) which may present health, fire, explosion, or environmental hazards.

Fume or particulate may aggravate existing asthma and pulmonary disease.

Product may contain small amounts of nickel and chromium and trace amounts of lead which may be released during processing in forms that are listed as carcinogens or potential carcinogens by OSHA, IARC or NPT

Molten metal or finely divided particulate, which has been ignited, may pose an explosion hazard in contact with water or other liquids. If fine particulate has ignited, use Class D Extinguishing agent.

## Section 3: Composition/Information on Ingredients

Component	CAS#	% by Weight
Carbon	1333-86-4	< 1.1 %
Chromium	7440-47-3	< 1.5 %
Manganese	7439-96-5	< 2.0 %
Molybdenum	7439-98-7	< 0.7 %
Nickel	7440-02-0	< 2.0 %
Silicon	7440-21-3	< 2.5 %
Iron	7439-89-6	balance

Other trace materials (< 1% by weight) may include aluminum, boron, calcium, cobalt, copper, lead, phosphorus, sulfur, tin, titanium, vanadium and zirconium.

## Section 4: First Aid Measures

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

**Eye Contact:** Immediately flush with water for at least 15 minutes; keep eyelids open; get medical attention  
**Skin Contact:** Wash with soap and water to remove particulates  
**Inhalation:** Remove from excessive exposure to fresh air immediately

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Ingestion: Not expected to occur

## Section 5: Fire Fighting Measures

In formed state (bars, rods, wire) steel is considered noncombustible. If particulate has ignited, wear NIOSH approved SCBA and full protective gear.

Suitable Extinguishing Media: Use Class D agent to extinguish a particulate fire.

Unsuitable Extinguishing Media: Water in contact with ignited particulate or molten metal may result in an explosion.

## Section 6: Accidental Release Measures

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

## Section 7: Handling and Storage

Store away from acids and calcium hypochlorite.

## Section 8: Exposure control/Personal Protection

Component	CAS#	Exposure Limits (mg/m3)		Carcinogen
		OSHA PEL	ACGIH TLV	
Carbon	1333-86-4	3.5	3.5	No
Chromium	7440-47-3	1	0.5	No
Manganese	7439-96-5	C 5	0.2	No
Molybdenum	7439-98-7	15 <sup>1</sup>	10 <sup>2</sup> , 3 <sup>3</sup>	No
Nickel	7440-02-0	1	1.5	No <sup>4</sup>
Silicon	7440-21-3	15 <sup>1</sup> , 5 <sup>5</sup>	1.0	No
Iron	7439-89-6	10	5	No

Other trace materials (< 1% by weight) may include but are not limited to aluminum, boron, calcium, cobalt, copper, lead, phosphorus, sulfur, titanium, tin, vanadium and zirconium.

<sup>1</sup> Total particulate (OSHA definition)

<sup>2</sup> Inhalable particulate (ACGIH definition)

<sup>3</sup> Respirable particulate (ACGIH definition)

<sup>4</sup> Some nickel compounds are carcinogens, excluding metallic nickel

<sup>5</sup> Respirable particulate (OSHA definition)

### 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.

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

### Respiratory Protection:

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 N,P,R-95 filter or supplied air in continuous mode.

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## General Hygiene Considerations

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.

## Section 9: Physical and Chemical Properties

Color:	Grey or grey-black
Odor:	Odorless
Physical State:	Solid metal
pH:	Not applicable
Melting Point:	>2500°F
Boiling Point:	>5400°F
Flash Point:	Nonflammable
Evaporation Rate:	Not applicable
Flammability (solid gas):	Not applicable
Upper Flammability Limit:	Not applicable
Lower Flammability Limit:	Not applicable
Vapor Pressure:	1 @ 3254° F
Vapor Density:	Not applicable
Specific Gravity:	7.84 @ 60°F
Solubility (water):	Not applicable
Partition Coefficient (n-octane/water)	Not applicable
Auto Ignition Temperature:	Not applicable
Percent Volatile (wt%):	Not applicable
Volatile Organic Compound Content (wt%):	Not applicable

## Section 10: Stability and Reactivity

Stability:	Stable
Incompatible Materials:	Liberates hydrogen on contact with acids
Hazardous Decomposition Products:	Hazardous metallic dust (particulate) and fume may be generated from welding, brazing, cutting, burning, grinding, sanding, sawing and during some machine activities

## Section 11: Toxicological Information

Note: Steel billets, rods, wire and bars in their final manufactured state do not present inhalation, ingestion or contact hazard. However, operations such as welding, burning flame or laser cutting, brazing, grinding, sanding and sawing may release fume and other particulate (metal dust) which may present health hazards if concentrations exceed individual compound PELs or TLVs.

<b>Routes of Entry:</b>	Inhalation -	may occur during welding, cutting, or grinding
	Ingestion -	not a significant route of entry but during welding, cutting or grinding may enter eye and impact skin.

<b>Target Organs:</b>	Iron oxide -	lungs
	Carbon -	lungs
	Chromium -	skin, nose, throat, eyes
	Lead -	CNS (central nervous system), blood forming organs
	Manganese -	CNS, lungs, reproductive (males)
	Molybdenum -	lungs, CNS
	Nickel -	skin, lungs
	Silicon -	eyes, skin, respiratory system

### Acute exposure:

Exposure to fume and particulate may produce irritation of the eyes and respiratory system (nose, throat, bronchi). Inhalation of high concentration 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 delayed influenza - like symptoms.

### Chronic exposure:

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

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increase the risk of lung cancer development when also exposed to pulmonary carcinogens. Manganese may affect the central nervous system, causing sleepiness, 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.

## Symptoms:

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.

## Section 12: Ecological Information

Steel in the solid manufactured state does not present an ecological hazard.

## Section 13: Disposal Considerations

**Disposal:** 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, ect.) 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.

## Section 14: Transport Information

Steel rods, wires and bars in their final manufactured state are not a US Department of Transportation (US 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
Label Code:	4.2
Packaging:	No exceptions 213, 241
Placard:	SPONTANEOUS COMBUSTIBLE

## Section 15: Regulatory Information

**ACGIH** Threshold Limit Values for Chemical Substance and Physical Agents, 2003

**NIOSH** Pocket Guide to Chemical Hazards, 2001

**US DOT** Emergency Response Guide to Chemical Hazards, 2001

**29 CFR 1910** OSHA Standards for General Industry including Table Z-1 and Subpart 1000 (air contaminants); Subpart Q Welding, Cutting and Brazing  
Section .132 Personal Protection Equipment  
Section .133 Eye and Face Protection  
Section .134 Respiratory Protection  
Section .151 Medical Services and First Aid  
Section .1025 Lead  
Section .1200 Hazard Communication

**29 CFR 1915** OSHA Shipyard Standards

**29 CFR 1926** OSHA Standards for the Construction Industry

**49 CFR Parts 100-185** US Department of Transportation Hazard Materials Regulations

**40 CFR 370** SARA Title III Section 302 Reportable Quantity. Section 311 Hazard Chemical Reporting, Subpart B Reporting Requirements, Section 312 Hazardous Chemical Reporting, Subpart D Inventory Forms, Section 313 Emissions Reporting Form R

## Section 16: Other Information

Not applicable

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**Disclaimer:** The information presented herein is presented in good faith and is believed to be accurate as of the effective date of this Material Safety Data Sheet. Employers may use this MSDS to supplement other information gathered by them in their efforts to assure the health and safety of their employees and the proper use of the product. This summary of the relevant data reflects professional judgment; employers should note that information perceived to be less relevant has not been included in this MSDS. Therefore, given the summary nature of this document, Charter Steel does not extend any warranty (expressed or implied), assume any responsibility, or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user.

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