

Material Safety Data Sheet

Material Name: Carbon Steel

*** Section 1 - Chemical Product and Company Identification ***

Manufacturer Information

Gerdau Ameristeel
4221 West Boy Scout Blvd.
Suite 600
Tampa, FL 33607

Phone: (800) 876-3626

Emergency # 800-424-9300 CHEMTREC

*** Section 2 - Hazards Identification ***

Emergency Overview

Fumes may cause irritation of the eyes and respiratory tract.

Potential Health Effects: Eyes

May cause irritation.

Potential Health Effects: Skin

Not considered to cause skin effects. Sensitive individuals may experience skin irritation.

Potential Health Effects: Ingestion

Not considered a route of exposure under anticipated product use conditions.

Potential Health Effects: Inhalation

Inhalation of fumes may cause irritation of the nose, throat and lungs. Chronic irritation may cause bronchitis, pneumonitis, siderosis, upper respiratory tract irritation, headaches, lack of coordination, metal fume fever.

Medical Conditions Aggravated by Exposure

Respiratory conditions may be aggravated by exposure to metal fumes or dusts.

HMIS Ratings: Health: 1 Fire: 0 HMIS Reactivity 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 3 - Composition / Information on Ingredients ***

CAS #	Component	Percent
1309-37-1	Iron oxide	97
7439-96-5	Manganese	2
7440-50-8	Copper	1.5
124-38-9	Carbon dioxide	0.9
7440-02-0	Nickel	0.5
7440-21-3	Silicon	0.4
7440-31-5	Tin	0.08
7446-09-5	Sulfur dioxide	0.08
7723-14-0	Phosphorus	0.06
1314-62-1	Vanadium pentoxide	0.05

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

First Aid: Skin

For skin contact, flush with large amounts of water. If irritation persists, get medical attention.

First Aid: Ingestion

If the material is swallowed, get immediate medical attention or advice.

First Aid: Inhalation

Move person to non-contaminated air. Seek medical attention.

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

See Section 9 for Flammability Properties.

Concentrations of metallic fines in the air could present an explosion hazard.

Material Safety Data Sheet

Material Name: Carbon Steel

Hazardous Combustion Products

Above the melting point, iron oxide fumes may be present.

Extinguishing Media

For molten metal, use Class D chemical or sand.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

None necessary.

Clean-Up Procedures

Fine particles and small chips should be swept up and disposed of properly.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

User should consult applicable standards for specific process employed to determine any special precautions needed to insure the health and safety of its employees.

*** Section 7 - Handling and Storage ***

Handling Procedures

Avoid contact with skin and eyes. Wash thoroughly after handling.

Storage Procedures

No special storage procedures necessary.

*** Section 8 - Exposure Controls / Personal Protection ***

A: Component Exposure Limits

Iron oxide (1309-37-1)

ACGIH: 5 mg/m3 TWA (respirable fraction)
OSHA: 10 mg/m3 TWA (fume)
NIOSH: 5 mg/m3 TWA (dust and fume, as Fe)

Manganese (7439-96-5)

ACGIH: 0.2 mg/m3 TWA
OSHA: 1 mg/m3 TWA (fume)
3 mg/m3 STEL (fume)
5 mg/m3 Ceiling
NIOSH: 1 mg/m3 TWA (fume)
3 mg/m3 STEL

Copper (7440-50-8)

ACGIH: 0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist, as Cu)
OSHA: 0.1 mg/m3 TWA (dust, fume, mists, as Cu)
NIOSH: 1 mg/m3 TWA (dust and mist)

Carbon dioxide (124-38-9)

ACGIH: 5000 ppm TWA
30000 ppm STEL
OSHA: 10000 ppm TWA; 18000 mg/m3 TWA
30000 ppm STEL; 54000 mg/m3 STEL
NIOSH: 5000 ppm TWA; 9000 mg/m3 TWA
30000 ppm STEL; 54000 mg/m3 STEL

Material Safety Data Sheet

Material Name: Carbon Steel

Nickel (7440-02-0)

ACGIH: 1.5 mg/m3 TWA (inhalable fraction)
OSHA: 1 mg/m3 TWA
NIOSH: 0.015 mg/m3 TWA

Silicon (7440-21-3)

OSHA: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)

Tin (7440-31-5)

ACGIH: 2 mg/m3 TWA
OSHA: 2 mg/m3 TWA
NIOSH: 2 mg/m3 TWA

Sulfur dioxide (7446-09-5)

ACGIH: 2 ppm TWA
5 ppm STEL
OSHA: 2 ppm TWA; 5 mg/m3 TWA
5 ppm STEL; 15 mg/m3 STEL
NIOSH: 2 ppm TWA; 5 mg/m3 TWA
5 ppm STEL; 13 mg/m3 STEL

Phosphorus (7723-14-0)

OSHA: 0.1 mg/m3 TWA
NIOSH: 0.1 mg/m3 TWA

Vanadium pentoxide (1314-62-1)

ACGIH: 0.05 mg/m3 TWA (dust or fume, respirable fraction)
NIOSH: 0.05 mg/m3 Ceiling (15 min, dust and fume, as V)

Engineering Controls

Use general ventilation and use local exhaust, where possible, in confined or enclosed spaces.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles for fumes which may arise from thermal processing.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

Personal Protective Equipment: General

Eye wash fountain and emergency showers are recommended.

*** Section 9 - Physical & Chemical Properties ***

Appearance:	Grey metallic	Odor:	Metallic or odorless
Physical State:	Solid	pH:	NA
Vapor Pressure:	NA	Vapor Density:	NA
Boiling Point:	3000°C (5432°F)	Melting Point:	1535°C (2795°F)
Solubility (H2O):	NA	Specific Gravity:	7.0
Evaporation Rate:	NA	VOC:	NA
Octanol/H2O Coeff.:	NA	Flash Point:	NA
Flash Point Method:	NA	Upper Flammability Limit	NA
Lower Flammability Limit	NA	(UFL):	NA
(LFL):	NA	Burning Rate:	NA
Auto Ignition:	NA		

Material Safety Data Sheet

Material Name: Carbon Steel

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

This is a stable material.

Chemical Stability: Conditions to Avoid

None

Incompatibility

Strong Acids

Hazardous Decomposition

Metal fumes if heated. Above the melting point, iron oxide fumes may be present

Possibility of Hazardous Reactions

Will not occur.

*** Section 11 - Toxicological Information ***

Acute Dose Effects

A: General Product Information

Operations or fire which supply sufficient energy to the product (i.e. welding, high speed grinding or melting) can release dust or fumes which may make components of the product biologically available. Exposure to dusts or fumes from some metals including iron, zinc, manganese, chromium, cobalt and copper can produce a condition known as metal fume fever. Iron dust can irritate the eyes and respiratory tract by mechanical action. Acute iron poisoning may involve hemorrhagic vomiting and diarrhea, abdominal pain, acidosis, coagulaopathy, shock, coma and convulsions followed by hepatic and renal failure and perhaps cardiovascular collapse. Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis.

Systemic effects from ingestion of nickel include capillary damage, kidney damage, myocardial weakness and central nervous system depression. Allergic skin sensitization reactions are the most frequent effect of exposure to nickel compounds. Exposure to nickel compounds may also result in allergic lung sensitization. Exposure to copper fume or dust can cause respiratory tract irritation, hemolytic anemia and allergic contact dermatitis.

B: Component Analysis - LD50/LC50

Iron oxide (1309-37-1)

Oral LD50 Rat: >10000 mg/kg

Manganese (7439-96-5)

Oral LD50 Rat: 9 g/kg

Nickel (7440-02-0)

Oral LD50 Rat: >9000 mg/kg

Silicon (7440-21-3)

Oral LD50 Rat: 3160 mg/kg

Sulfur dioxide (7446-09-5)

Inhalation LC50 Rat: 2500 ppm/1H

Phosphorus (7723-14-0)

Inhalation LC50 Rat: 4.3 mg/L/1H; Oral LD50 Rat:3.03 mg/kg; Dermal LD50 Rat:100 mg/kg

Vanadium pentoxide (1314-62-1)

Inhalation LC50 Rat: 2.21 mg/L/4H; Oral LD50 Rat:10 mg/kg; Dermal LD50 Rat:>2500 mg/kg

Carcinogenicity

A: General Product Information

The carcinogenic effect of nickel has been well documented in occupationally exposed nickel refinery workers. Lung and nasal cancers were the predominant forms of cancer in the exposed workers.

Material Safety Data Sheet

Material Name: Carbon Steel

B: Component Carcinogenicity

Iron oxide (1309-37-1)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Supplement 7 [1987], Monograph 1 [1972] (Group 3 (not classifiable))

Nickel (7440-02-0)

ACGIH: A5 - Not Suspected as a Human Carcinogen
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 49 [1990], Supplement 7 [1987] (Group 2B (possibly carcinogenic to humans))

Sulfur dioxide (7446-09-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 54 [1992] (Group 3 (not classifiable))

Vanadium pentoxide (1314-62-1)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 86 [2006] (Group 2B (possibly carcinogenic to humans))

Teratogenicity

Manganese, copper and nickel have been reported to have adverse reproductive effects in experimental animals. Copper and nickel have been shown to be fetotoxic in experimental animals.

Neurological Effects

Chronic overexposure to manganese compounds may result in CNS effects such as weakness, sleepiness, emotional instability and spastic gait. These effects can be permanent.

Other Toxicological Information

Under normal conditions of handling, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Copper (7440-50-8)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	23 µg/L	
96 Hr LC50 Oncorhynchus mykiss	13.8 µg/L	
96 Hr LC50 Lepomis macrochirus	236 µg/L	
72 Hr EC50 Scenedesmus subspicatus	120 µg/L	
96 Hr EC50 water flea	10 µg/L	
96 Hr EC50 water flea	200 µg/L	

Nickel (7440-02-0)

Test & Species		Conditions
96 Hr LC50 Oncorhynchus mykiss	31.7 mg/L	adult
96 Hr LC50 Pimephales promelas	3.1 mg/L	
96 Hr LC50 Brachydanio rerio	>100 mg/L	
72 Hr EC50 freshwater algae (4 species)	0.1 mg/L	
72 Hr EC50 Selenastrum capricornutum	0.18 mg/L	
96 Hr EC50 water flea	510 µg/L	

Material Safety Data Sheet

Material Name: Carbon Steel

Phosphorus (7723-14-0)

Test & Species

	Conditions
96 Hr LC50 Lepomis macrochirus	0.0024 mg/L [flow-through]
96 Hr LC50 Brachydanio rerio	>100 mg/L [static]
48 Hr EC50 Daphnia magna	0.111 mg/L

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

Component Waste Numbers

Vanadium pentoxide (1314-62-1)

RCRA: waste number P120

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Not Regulated

TDG Information

Shipping Name: Not Regulated

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Manganese (7439-96-5)

SARA 313: 1.0 % de minimis concentration

Copper (7440-50-8)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Nickel (7440-02-0)

SARA 313: 0.1 % de minimis concentration

CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Sulfur dioxide (7446-09-5)

SARA 302: 500 lb TPQ

Material Safety Data Sheet

Material Name: Carbon Steel

Phosphorus (7723-14-0)

SARA 302: 100 lb TPQ (This material is a reactive solid. The TPQ does not default to 10000 pounds for non-powder, non-molten, non-solvent form)

CERCLA: 1 lb final RQ; 0.454 kg final RQ

Vanadium pentoxide (1314-62-1)

SARA 302: 100 lb lower threshold TPQ; 10000 lb upper threshold TPQ

CERCLA: 1000 lb final RQ; 454 kg final RQ

B: Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	DOT regulated severe marine pollutant

State Regulations

A: General Product Information

Product may be subject to reporting in states other than those listed for individual components.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Iron oxide	1309-37-1	Yes	Yes	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	Yes
Carbon dioxide	124-38-9	Yes	Yes	Yes	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes	Yes	Yes	Yes
Silicon	7440-21-3	No	Yes	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	Yes	Yes
Sulfur dioxide	7446-09-5	Yes	Yes	Yes	Yes	Yes	Yes
Phosphorus	7723-14-0	Yes	Yes	Yes	Yes	Yes	Yes
Vanadium pentoxide	1314-62-1	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Iron oxide	1309-37-1	1 %
Manganese	7439-96-5	1 %
Copper	7440-50-8	1 %
Nickel	7440-02-0	0.1 %

Additional Regulatory Information

Material Safety Data Sheet

Material Name: Carbon Steel

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Iron oxide	1309-37-1	Yes	DSL	EINECS
Manganese	7439-96-5	Yes	DSL	EINECS
Copper	7440-50-8	Yes	DSL	EINECS
Carbon dioxide	124-38-9	Yes	DSL	EINECS
Nickel	7440-02-0	Yes	DSL	EINECS
Silicon	7440-21-3	Yes	DSL	EINECS
Tin	7440-31-5	Yes	DSL	EINECS
Sulfur dioxide	7446-09-5	Yes	DSL	EINECS
Phosphorus	7723-14-0	Yes	DSL	EINECS
Vanadium pentoxide	1314-62-1	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

End of Sheet