

Section 1 - Chemical Product and Company Identification

Product Name: Cast Iron Powder

Product Use: Industrial applications and Art

Supplier Information:

Chemical Store Inc.

1059 Main Avenue

Clifton, NJ 07011

Website: www.ChemicalStore.com

Phone: 973-405-6248

Emergency Contact: Chemtrec 1-800-424-9300

Section 2 - Hazards Identification

Emergency Overview

Cast Iron Powder is a non-combustible, non-reactive solid material. Processing of the product for some final uses can include formation of dusts, particulates or fumes which may present certain health hazards. Generation of large quantities of airborne dusts and particulates may produce a fire hazard. Molten metal may react violently with water. Exposure to powder or dusts may be irritating to eyes, nose and throat. Product may cause mechanical abrasions and irritation to the eyes and skin.

Hazard Statements

CAUTION Dusts, particulates or fumes generated from this product may be irritating to the eyes, skin and respiratory system and may cause fever, chills and muscular aches. May contain nickel, cobalt, chromium, and arsenic which may cause allergic skin and/or respiratory sensitization reactions. May contain arsenic, cobalt, lead and nickel which may cause cancer.

Potential Health Effects: Eyes

Dust or powder may cause irritation and/or inflammation to the eye tissue. Rubbing may cause abrasion of cornea.

Potential Health Effects: Skin

Product contains trace levels (<0.1%) of components that may cause allergic skin reactions. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely; however if ingested may cause gastrointestinal disturbances, abdominal pain, fever, vomiting, and diarrhea. Ingestion of large amounts of product may produce more serious toxicities including: shock, metabolic acidosis, decreased white blood cell count, neurological damage, cardiovascular shock, anemia, liver damage, renal failure, lethargy and coma.

Potential Health Effects: Inhalation

Product contains trace levels (<0.1%) of components that may cause allergic respiratory sensitization and cancer. Dusts, vapors, and fumes generated during processing may irritate the respiratory system.

Overexposure to processing fumes may cause metal fume fever which is an influenza like illness. Symptoms include headache, metallic taste in the mouth, cough, thirst, throat irritation, shortness of breath, fever, sweating and pain in the limbs. Severe acute overexposure or chronic overexposure to dusts or processing fumes may produce more serious toxicities including: siderosis, lung damage, weakness, anorexia, impairment of sleep and vision, personality changes, blood formation effects, nervous and circulatory system damage, kidney damage, and may pose a reproductive hazard.

HMIS Ratings: Health: 1 Fire: 0 Physical Hazard: 0 Pers. Prot.: safety glasses with side shields, gloves Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Section 3 - Composition / Information on Ingredients

CAS #	Component	Percent
7439-89-6	Iron	>92
7440-44-0	Carbon	<5
7440-21-3	Silicon	<3
7440-03-1	Niobium	<0.1
7440-31-5	Tin	<0.1
7440-32-6	Titanium	<0.1
7440-38-2	Arsenic	<0.1
7439-92-1	Lead	<0.1
7429-90-5	Aluminum	<0.1
7440-02-0	Nickel	<0.1
7440-70-2	Calcium	<0.1
7440-42-8	Boron	<0.1
7440-47-3	Chromium	<0.1
7440-48-4	Cobalt	<0.1
7440-50-8	Copper	<0.1
7440-62-2	Vanadium	<0.1
7440-67-7	Zirconium	<0.1
7439-98-7	Molybdenum	<0.1

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Iron oxide (1309-37-1).

Component Information/Information on Non-Hazardous Components

Processing of this article may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). This data sheet is prepared as a guideline for typical uses of Cast Iron Powder. The user should be aware that the composition of the Cast Iron Powder can vary based upon the raw materials, processes used, and protective coatings that may have been applied to the original materials. The list of ingredients above are typical ingredients thought to be present in the Cast Iron Powder material. This list includes contaminants that may or may not be present. The percentages given vary from shipment to shipment and may not be entirely accurate for a given shipment.

Protective coatings, including paints, lubricants, corrosion inhibitors, etc., may have been applied to the material before it came under the control of the recycler. These coatings may contain hazardous materials. Typical hazardous materials contained in these coatings include: lead, zinc, chromium, and cadmium. Some organic materials may also be present. The supplier (recycler) may have no specific knowledge of the particular contaminant. However, it is anticipated that the hazardous materials present in the coatings would generally represent less than 0.1% of the total material present. The health hazards presented by these contaminants would produce their greatest potential for exposure during processes such as melting, cutting, welding. These processes could generate metal fumes that might produce the health hazards identified in section 3 of this MSDS.

It is suggested that the user protect employees by utilizing engineering controls that reduce exposures to acceptable concentrations. Where engineering controls are not feasible, appropriate personal protective equipment should be utilized.

Section 4 - First Aid Measures

First Aid: Eyes

In case of contact, flush immediately with water for at least 15 minutes. Do not rub eyes. If irritation persists get medical attention. In case of mechanical abrasions and cuts, seek medical attention immediately.

First Aid: Skin

For skin contact, wash immediately with soap and water. If irritation persists, get medical attention. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

First Aid: Ingestion

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek immediate medical attention. Do not induce vomiting unless directed to do so by medical personnel.

First Aid: Inhalation

If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. Seek medical attention immediately.

First Aid: Notes to Physician

No additional information available.

Section 5 - Fire Fighting Measures

General Fire Hazards

See Section 9 for Flammability Properties.

Dust accumulation from this product may present an explosion hazard in the presence of an ignition source. Coatings and oils applied to the product may enhance flammability.

Hazardous Combustion Products

This product may release metal oxide fumes by thermal decomposition.

Extinguishing Media

Dry chemical, soda ash, sand. Molten metal may react violently with water.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

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

Containment of this material should not be necessary. If dusts or particulates are generated, eliminate sources of ignition.

Clean-Up Procedures

Small pieces of this product may be collected with a broom and shovel. Collect dust or particulates using a vacuum cleaner with a HEPA filter. Put material in suitable, covered, labeled containers.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

None necessary.

Section 7 - Handling and Storage

Handling Procedures

Avoid inhaling dusts or vapors produced during thermal processing. Avoid eye and excessive skin contact. Use only with adequate ventilation. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Special care must be taken to avoid buildup of dusts.

Storage Procedures

Keep this material in a cool, well-ventilated place.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

A: General Product Information

Follow all applicable exposure limits. Keep formation of dusts, particulates and fumes to a minimum.

ACGIH:	5 mg/m ³ TWA (respirable fraction) (related to Iron oxide)
OSHA (Final):	10 mg/m ³ TWA (fume) (related to Iron oxide)
OSHA (Vacated):	10 mg/m ³ TWA (fume) (related to Iron oxide)
NIOSH:	5 mg/m ³ TWA (Fe, dust and fume) (related to Iron oxide)
Alberta:	5 mg/m ³ TWA (respirable dust and fume) (related to Iron oxide)
British Columbia:	10 mg/m ³ TWA (total particulate matter containing no asbestos and less than 1% crystalline silica, total particulate); 3 mg/m ³ TWA (particulate matter containing no asbestos and less than 1% crystalline silica, respirable particulate); 5 mg/m ³ TWA (Fe, dust and fume) (related to Iron oxide) 10 mg/m ³ STEL (Fe, fume) (related to Iron oxide)
Manitoba:	5 mg/m ³ TWA (respirable fraction) (related to Iron oxide)
New Brunswick:	5 mg/m ³ TWA (Fe, particulate matter containing no asbestos and < 1% crystalline silica, dust and fume) (related to Iron oxide)
NW Territories:	5 mg/m ³ TWA (respirable mass); 10 mg/m ³ TWA (total mass) (related to Iron oxide)
Nova Scotia:	5 mg/m ³ TWA (respirable fraction) (related to Iron oxide)
Nunavut:	5 mg/m ³ TWA (respirable mass); 10 mg/m ³ TWA (total mass) (related to Iron oxide)
Ontario:	5 mg/m ³ TWAEV (respirable); 10 mg/m ³ TWAEV (total dust) (related to Iron oxide)
Quebec:	5 mg/m ³ TWAEV (Fe, dust and fume) (related to Iron oxide)
Saskatchewan:	5 mg/m ³ TWA (Fe, dust and fume) (related to Iron oxide) 10 mg/m ³ STEL (Fe, dust and fume) (related to Iron oxide)
Yukon:	5 mg/m ³ TWA (Fe ₂ O ₃ , fume) (related to Iron oxide) 10 mg/m ³ STEL (fume) (related to Iron oxide)

B: Component Exposure Limits Iron (7439-89-6)

Silicon (7440-21-3)

OSHA (Final):	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)
OSHA (Vacated):	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)
NIOSH:	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)
Alberta:	10 mg/m ³ TWA
British Columbia:	10 mg/m ³ TWA (total dust); 3 mg/m ³ TWA (respirable fraction)
New Brunswick:	10 mg/m ³ TWA
NW Territories:	5 mg/m ³ TWA (respirable mass); 10 mg/m ³ TWA (total mass)
Nunavut:	5 mg/m ³ TWA (respirable mass); 10 mg/m ³ TWA (total mass)
Ontario:	10 mg/m ³ TWAEV (total dust)
Quebec:	10 mg/m ³ TWAEV (total dust, containing no asbestos and less than 1% crystalline silica)
Saskatchewan:	10 mg/m ³ TWA 20 mg/m ³ STEL

Yukon: 30 mppcf TWA; 10 mg/m³ TWA
20 mg/m³ STEL

Molybdenum (7439-98-7)

ACGIH: 10 mg/m³ TWA (inhalable fraction); 3 mg/m³ TWA (respirable fraction)
OSHA (Vacated): 10 mg/m³ TWA
Alberta: 10 mg/m³ TWA (total); 3 mg/m³ TWA (respirable)
British Columbia: 3 mg/m³ TWA (respirable); 10 mg/m³ TWA (inhalable)
Manitoba: 10 mg/m³ TWA (inhalable fraction); 3 mg/m³ TWA (respirable fraction)
Nova Scotia: 10 mg/m³ TWA (inhalable fraction); 3 mg/m³ TWA (respirable fraction)
Ontario: 10 mg/m³ TWAEV (metal, inhalable); 3 mg/m³ TWAEV (metal, respirable)
Saskatchewan: 10 mg/m³ TWA (inhalable fraction); 3 mg/m³ TWA (respirable fraction) 20 mg/m³
STEL (inhalable fraction); 6 mg/m³ STEL (respirable fraction)

Nickel (7440-02-0)

ACGIH: 1.5 mg/m³ TWA (inhalable fraction)
OSHA (Final): 1 mg/m³ TWA
OSHA (Vacated): 1 mg/m³ TWA
NIOSH: 0.015 mg/m³ TWA
Alberta: 1.5 mg/m³ TWA
British Columbia: ACGIH Category A1 - Confirmed Human Carcinogen; IARC Category 1 - Human
Carcinogen
Manitoba: 1.5 mg/m³ TWA (inhalable fraction)
New Brunswick: 1 mg/m³ TWA
NW Territories: mg/m³ TWA
mg/m³ STEL
Nova Scotia: 1.5 mg/m³ TWA (inhalable fraction)
Nunavut: mg/m³ TWA
mg/m³ STEL
Ontario: 1 mg/m³ TWAEV (inhalable)
Quebec: 1 mg/m³ TWAEV
Saskatchewan: Present
1.5 mg/m³ TWA (inhalable
fraction) 3 mg/m³ STEL (inhalable
fraction)
Yukon: 1 mg/m³ TWA
3 mg/m³ STEL

Aluminum (7429-90-5)

ACGIH: 1 mg/m³ TWA (respirable fraction)
OSHA (Final): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
OSHA (Vacated): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)
Alberta: 10 mg/m³ TWA (dust)
British Columbia: 1.0 mg/m³ TWA (respirable)
Manitoba: 1 mg/m³ TWA (respirable fraction)
New Brunswick: 10 mg/m³ TWA (metal dust)
NW Territories: 10 mg/m³ TWA
20 mg/m³ STEL
Nova Scotia: 1 mg/m³ TWA (respirable fraction)

Nunavut: 10 mg/m³ TWA
20 mg/m³ STEL
Ontario: 5 mg/m³ TWAEV (powder); 10 mg/m³ TWAEV (metal and oxide)
Quebec: 10 mg/m³ TWAEV
Saskatchewan: 10 mg/m³ TWA (dust)
20 mg/m³ STEL

Tin (7440-31-5)

ACGIH: 2 mg/m³ TWA
OSHA (Vacated): 2 mg/m³ TWA
NIOSH: 2 mg/m³ TWA
Alberta: 2 mg/m³ TWA
British Columbia: 2 mg/m³ TWA
Manitoba: 2 mg/m³ TWA
New Brunswick: 2 mg/m³ TWA
Nova Scotia: 2 mg/m³ TWA
Ontario: 2 mg/m³ TWAEV
Quebec: 2 mg/m³ TWAEV
Saskatchewan: 2 mg/m³ TWA
4 mg/m³ STEL

Arsenic (7440-38-2)

ACGIH: 0.01 mg/m³ TWA
OSHA (Vacated): 0.5 mg/m³ TWA
NIOSH: 0.002 mg/m³ Ceiling (15 min)
Alberta: Designated substance - requires code of practice
0.01 mg/m³ TWA
British Columbia: ACGIH Category A1 - Confirmed Human Carcinogen; IARC Category 1 - Human Carcinogen
Manitoba: 0.01 mg/m³ TWA
New Brunswick: 0.01 mg/m³ TWA
NW Territories: 0.2 mg/m³ TWA
0.6 mg/m³ STEL
Nova Scotia: 0.01 mg/m³ TWA
Nunavut: 0.2 mg/m³ TWA
0.6 mg/m³ STEL
Ontario: 10 µg/m³ TWAEV; 50 µg/m³ STEV
10 µg/m³ TWAEV (designated substance regulation) 50 µg/m³ STEV (designated)
Quebec: 0.1 mg/m³ TWAEV
Saskatchewan: Present
0.01 mg/m³ TWA
0.03 mg/m³ STEL
Yukon: 0.5 mg/m³ TWA
0.5 mg/m³ STEL

Lead (7439-92-1)

ACGIH: 0.05 mg/m³ TWA
OSHA: 30 µg/m³ Action Level (Poison, See 29 CFR 1910.1025); 50 µg/m³ TWA
OSHA (Final): 50 µg/m³ TWA
NIOSH: 0.050 mg/m³ TWA

Alberta:	Designated substance - requires code of practice 0.05 mg/m3 TWA
British Columbia:	IARC Category 2B - Possible Human Carcinogen; Adverse reproductive effect
Manitoba:	0.05 mg/m3 TWA
New Brunswick:	0.05 mg/m3 TWA
NW Territories:	0.15 mg/m3 TWA 0.45 mg/m3 STEL
Nova Scotia:	0.05 mg/m3 TWA
Nunavut:	0.15 mg/m3 TWA 0.45 mg/m3 STEL
Ontario:	0.05 mg/m3 TWAEV 0.05 mg/m3 TWAEV (designated substance regulation)
Quebec:	0.05 mg/m3 TWAEV
Saskatchewan:	Present 0.05 mg/m3 TWA 0.15 mg/m3 STEL
Yukon:	0.15 mg/m3 TWA (dust and fume) 0.45 mg/m3 STEL (dust and fume)

Chromium (7440-47-3)

ACGIH:	0.5 mg/m3 TWA
OSHA (Final):	1 mg/m3 TWA
OSHA (Vacated):	1 mg/m3 TWA
NIOSH:	0.5 mg/m3 TWA
Alberta:	0.5 mg/m3 TWA
British Columbia:	0.5 mg/m3 TWA
Manitoba:	0.5 mg/m3 TWA
New Brunswick:	0.5 mg/m3 TWA
NW Territories:	0.5 mg/m3 TWA 1.5 mg/m3 STEL
Nova Scotia:	0.5 mg/m3 TWA
Nunavut:	0.5 mg/m3 TWA 1.5 mg/m3 STEL
Ontario:	0.5 mg/m3 TWAEV
Quebec:	0.5 mg/m3 TWAEV
Saskatchewan:	0.5 mg/m3 TWA 1.5 mg/m3 STEL
Yukon:	0.1 mg/m3 TWA 3.0 mg/m3 STEL

Cobalt (7440-48-4)

ACGIH:	0.02 mg/m3 TWA
OSHA (Final):	0.1 mg/m3 TWA (dust and fume)
OSHA (Vacated):	0.05 mg/m3 TWA (dust and fume)
NIOSH:	0.05 mg/m3 TWA (dust and fume)
Alberta:	0.02 mg/m3 TWA
British Columbia:	IARC Category 2B - Possible Human Carcinogen
Manitoba:	0.02 mg/m3 TWA

New Brunswick: 0.02 mg/m³ TWA
 NW Territories: 0.1 mg/m³ TWA (dust and fume)
 0.3 mg/m³ STEL (dust and fume)
 Nova Scotia: 0.02 mg/m³ TWA
 Nunavut: 0.1 mg/m³ TWA (metal dust and fume)
 0.3 mg/m³ STEL (dust and fume)
 Ontario: 0.02 mg/m³ TWAEV (dust and fume)
 Quebec: 0.02 mg/m³ TWAEV
 Saskatchewan: Present
 0.02 mg/m³ TWA
 0.06 mg/m³ STEL
 Yukon: 0.05 mg/m³ TWA (dust and fume)
 0.15 mg/m³ STEL (dust and fume)

Copper (7440-50-8)

ACGIH: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (Cu, dust and mist)
 OSHA (Final): 0.1 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 OSHA 0.1 mg/m³ TWA (Cu, dust, fume, mist)
 (Vacated):
 NIOSH: 1 mg/m³ TWA (dust and mist); 0.1 mg/m³ TWA (fume)
 Alberta: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 British Columbia: 1 mg/m³ TWA (dust and mist); 0.2 mg/m³ TWA (fume)
 Manitoba: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (Cu, dust and mist)
 New Brunswick: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 NW Territories: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 0.6 mg/m³ STEL (fume); 2 mg/m³ STEL (dust and mist)
 Nova Scotia: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (Cu, dust and mist)
 Nunavut: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 0.6 mg/m³ STEL (fume); 2 mg/m³ STEL (dust and mist)
 Ontario: 0.2 mg/m³ TWAEV (fume); 1 mg/m³ TWAEV (dust and mist)
 Quebec: 0.2 mg/m³ TWAEV (fume); 1 mg/m³ TWAEV (dust and mist)
 Saskatchewan: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 0.6 mg/m³ STEL (fume); 3 mg/m³ STEL (dust and mist)
 Yukon: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dust and mist)
 0.2 mg/m³ STEL (fume); 2 mg/m³ STEL (dust and mist)

Vanadium (7440-62-2)

OSHA (Final): 0.5 mg/m³ Ceiling (V₂O₅, respirable dust); 0.1 mg/m³ Ceiling (V₂O₅,
 OSHA 0.05 mg/m³ TWA (V₂O₅, respirable dust); 0.05 mg/m³ TWA (V₂O₅, fume)
 (Vacated):
 NIOSH: 1 mg/m³ TWA
 3 mg/m³ STEL

Zirconium (7440-67-7)

ACGIH: 5 mg/m³ TWA
 10 mg/m³ STEL
 OSHA 5 mg/m³ TWA
 (Vacated): 10 mg/m³ STEL

NIOSH:	5 mg/m ³ TWA
	10 mg/m ³ STEL
Alberta:	5 mg/m ³ TWA
	10 mg/m ³ STEL
British Columbia:	5 mg/m ³ TWA
	10 mg/m ³ STEL
Manitoba:	5 mg/m ³ TWA
	10 mg/m ³ STEL
New Brunswick:	5 mg/m ³ TWA
	10 mg/m ³ STEL
Nova Scotia:	5 mg/m ³ TWA
	10 mg/m ³ STEL
Ontario:	10 mg/m ³ STEV
Quebec:	5 mg/m ³ TWAEV
	10 mg/m ³ STEV
Saskatchewan:	5 mg/m ³ TWA
	10 mg/m ³ STEL

Engineering Controls

Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH approved respiratory protection must be provided.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

Section 9 - Physical & Chemical Properties

Appearance: Gray, black, brown particles

Odor: Not available

Physical State: Coarse Powder

pH: Not applicable

Vapor Pressure: Not applicable

Vapor Density: Not applicable

Section 10 - Chemical Stability & Reactivity Information

Chemical Stability

Stable under normal conditions.

Chemical Stability: Conditions to Avoid

Molten metal may react violently with water. Fine particles, dust or fumes may be flammable or explosive.

Incompatibility

Hot iron wire burns in chlorine gas, iron reacts with chlorine trifluoride and calcium hypochlorite, powdered iron reacts with fluorine below redness with incandescence, violent decomposition of hydrogen peroxide may be caused by contact with iron, reduced iron decomposes nitrogen dioxide at ordinary temperatures with incandescence.

Hazardous Decomposition

Decomposition of this product may yield metallic oxides.

Possibility of Hazardous Reactions

Will not occur.

Section 11 - Toxicological Information

Acute Dose Effects

A: General Product Information

No information available for the product. Operations 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, chromium, cobalt and copper can produce a condition known as metal fume fever, a flu-like illness generally lasting 24 hours or less including symptoms of nausea, vomiting, chest tightness, muscle aches and weakness. 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. This is considered benign pneumoconiosis and does not ordinarily cause significant physiologic impairment. Chronic overexposure to aluminum can result in lung damage and has been associated with asthma-like syndrome. Accumulation of aluminum in the body may result in neurological damage, anemia and bone softening. With acute exposure, arsenic can cause damage to mucous membranes and skin, and is a severe eye and respiratory tract irritant. Arsenic can also cause severe gastrointestinal damage, muscle cramps, cardiac abnormalities, anemia, decreased white blood cell count, and enlargement of the liver. Arsenic compounds may cause allergic skin sensitization. Repeated overexposure to high levels of aluminum oxide may lead to pulmonary fibrosis, a progressive lung disorder. Ingestion of boron in humans can cause gastrointestinal effects. There are also reports of effects of boron on the liver and kidney. 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. Contact with nickel compounds may also result in allergic lung sensitization reactions. Chronic exposure to copper fume or dust can cause respiratory tract irritation, hemolytic anemia and allergic contact dermatitis. Lead has been found to have toxic effects on both the central and peripheral nervous systems. Acute exposure to lead may cause acute encephalopathy which is accompanied by the symptoms of ataxis, coma, and convulsions. As toxicity progresses, symptoms of peripheral neuropathy can develop, as well as some cases of irreversible kidney damage. Effects of overexposure to cobalt include lung effects (irritation, fibrosis, asthma, pneumoconiosis), goiter and cardiovascular effects (cardiomyopathy), and allergic skin and lung sensitization reactions. Dusts and fumes from this product may cause cancer, reproductive and/or birth defects.

B: Component Analysis - LD50/LC50 Iron (7439-89-6)

Oral LD50 Rat 984 mg/kg

Carbon (7440-44-0)

Oral LD50 Rat >10000 mg/kg

Silicon (7440-21-3)

Oral LD50 Rat 3160 mg/kg

Nickel (7440-02-0)

Oral LD50 Rat >9000 mg/kg

Arsenic (7440-38-2)

Oral LD50 Rat 763 mg/kg

Boron (7440-42-8)

Oral LD50 Rat 650 mg/kg

Cobalt (7440-48-4)

Inhalation LC50 Rat >10 mg/L 1 h; Oral LD50 Rat 6170 mg/kg

Epidemiology

No information available for the product.

Carcinogenicity

A: General Product Information

No information available for the product. Although some lead salts have produced tumors in animals, the evidence is insufficient to determine the carcinogenicity of lead in humans. Inorganic arsenic can produce lung, skin and lymphatic cancer with long term occupational exposure above the established limits. A significant excess of lung cancer mortality was seen in a study of hard metal workers with at least one year of cobalt exposure. 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.

ACGIH: A4 - Not Classifiable as a Human Carcinogen (related to Iron oxide)

IARC: Supplement 7 [1987]; Monograph 1 [1972] (related to Iron oxide) (Group 3 (Not

B: Component Carcinogenicity Iron (7439-89-6)

Nickel (7440-02-0)

ACGIH: A5 - Not Suspected as a Human Carcinogen

OSHA: Present (Select 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

Aluminum (7429-90-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Arsenic (7440-38-2)

ACGIH: A1 - Confirmed Human Carcinogen

OSHA: Present (Select Carcinogen)

NIOSH: potential occupational carcinogen

IARC: Monograph 84 [2004] (in drinking water); Supplement 7 [1987]; Monograph 23 [1980] (Group 1 (Carcinogenic to humans))

Lead (7439-92-1)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

OSHA: 30 µg/m³ Action Level (Poison, See 29 CFR 1910.1025); 50 µg/m³ TWA Present (Select Carcinogen)

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 87 [2006] (evaluates inorganic lead compounds as Group 2A and organic lead compounds as Group 3) (Group 2A (Probably carcinogenic to humans))

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 49 [1990] (listed under Chromium and Chromium compounds);
Supplement 7 [1987] (Group 3 (Not classifiable))

Cobalt (7440-48-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
OSHA: Present (Select Carcinogen)
IARC: Monograph 86 [2006] (without tungsten carbide); Monograph 52 [1991] (Group 2B
(Possibly

Zirconium (7440-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Mutagenicity

No information available for the product. Aluminum and cobalt have been shown to increase the number of sister chromatid exchanges. Nickel inhibited DNA repair and induced transformation in experimental assays.

Teratogenicity

No information available for the product. Copper and nickel have been reported to have adverse reproductive effects and to be fetotoxic in experimental animals. Lead has a wide variety of reproductive effects in humans. It can affect both the male and female reproductive organs as well as egg and sperm production and development. Lead can also cause neurodevelopmental debilitations in children from both prenatal and postnatal exposures.

Neurological Effects

No information available for the product. Symptoms of lead toxicity include behavioral disturbances including irritability, restlessness, insomnia, and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. In acute lead encephalopathy, neurological damage can be permanent. Inhalation of fine aluminum particles has produced progressive encephalopathy, followed by dementia and convulsions.

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.

Test & Species		Conditions
96 Hr LC50 <i>Morone saxatilis</i>	13.6 mg/L	Static
96 Hr LC50 <i>Cyprinus carpio</i>	0.56 mg/L	Semi-static

B: Component Analysis - Ecotoxicity - Aquatic Toxicity Iron (7439-89-6)

Nickel (7440-02-0)

Test & Species		Conditions
96 Hr LC50 <i>Brachydanio rerio</i>	>100 mg/L	
96 Hr LC50 <i>Cyprinus carpio</i>	1.3 mg/L	Semi-static
96 Hr LC50 <i>Cyprinus carpio</i>	10.4 mg/L	Static

72 Hr EC50 *Pseudokirchneriella subcapitata* 0.18 mg/L

96 Hr EC50 Pseudokirchneriella subcapitata	0.174 - 0.311 mg/L	Static
48 Hr EC50 Daphnia magna	>100 mg/L	
48 Hr EC50 Daphnia magna	1 mg/L	Static

Lead (7439-92-1)

Test & Species		Conditions
96 Hr LC50 Cyprinus carpio	0.44 mg/L	Semi-static
96 Hr LC50 Oncorhynchus mykiss	1.17 mg/L	Flow-through
96 Hr LC50 Oncorhynchus mykiss	1.32 mg/L	Static
48 Hr EC50 water flea	600 µg/L	

Cobalt (7440-48-4)

Test & Species		Conditions
96 Hr LC50 Brachydanio rerio	>100 mg/L	Static

Copper (7440-50-8)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	0.0068 - 0.0156 mg/L	
96 Hr LC50 Pimephales promelas	<0.3 mg/L	Static
96 Hr LC50 Pimephales promelas	0.2 mg/L	Flow-through
96 Hr LC50 Oncorhynchus mykiss	0.052 mg/L	Flow-through
96 Hr LC50 Lepomis macrochirus	1.25 mg/L	Static
96 Hr LC50 Cyprinus carpio	0.3 mg/L	Semi-static
96 Hr LC50 Cyprinus carpio	0.8 mg/L	Static
96 Hr LC50 Poecilia reticulata	0.112 mg/L	Flow-through
72 Hr EC50 Pseudokirchneriella subcapitata	0.0426 - 0.0535 mg/L	Static
96 Hr EC50 Pseudokirchneriella subcapitata	0.031 - 0.054 mg/L	Static
48 Hr EC50 Daphnia magna	0.03 mg/L	Static

Environmental Fate

No information available for the product.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions A: General Product Information

This product contains a component or components identified as hazardous under 40 CFR 261.24.

B: Component Waste Numbers Arsenic (7440-38-2)

RCRA: 5.0 mg/L regulatory level

Lead (7439-92-1)

RCRA: 5.0 mg/L regulatory level

Chromium (7440-47-3)

RCRA: 5.0 mg/L regulatory level

Disposal Instructions

Byproducts and residues from this product may be reprocessed or recycled. Upon disposal, collected dusts and other similar wastes could contain a constituent identified as a hazardous waste. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes. See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Section 14 - Transportation Information

US DOT Information

Shipping Name: Certain forms of this material (i.e. powders, borings, shavings, turnings, cuttings, dross, etc.) may be subject to U.S. DOT hazardous material shipping requirements. If products are shipped in quantities which exceed the reportable quantity (RQ) for individual components, they may also meet the requirements as DOT hazardous materials. **UN/NA #:** Not available. **Hazard Class:** Not available.

Packing Group: Not available.

Required Label(s): Not available.

Additional Info.: Not available.

Section 15 - Regulatory Information

US Federal Regulations

A: General Product Information

Processing of this article may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). The following component analysis applies only to those facilities that are required to report under applicable regulations.

B: 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).

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)

Aluminum (7429-90-5)

SARA 313: 1.0 % de minimis concentration (dust or fume only)

Arsenic (7440-38-2)

SARA 313: 0.1 % de minimis concentration

CERCLA: 1 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); 0.454 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)

Lead (7439-92-1)

SARA 313: 0.1 % Supplier notification limit; 0.1 % de minimis concentration (when contained in stainless steel, brass, or bronze)

CERCLA: 10 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); 4.54 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)

Chromium (7440-47-3)

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)

Cobalt (7440-48-4)

SARA 313: 0.1 % 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)

Vanadium (7440-62-2)

SARA 313: 1.0 % de minimis concentration (except when contained in an alloy)

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

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

Component	CAS #	CA	FL	MA	MN	NJ	PA
Iron (¹ related to Iron oxide)	7439-89-6	Yes	No	Yes ¹	Yes ¹	Yes ¹	Yes ¹
Silicon	7440-21-3	No	No	Yes	Yes	Yes	Yes
Molybdenum	7439-98-7	Yes	No	Yes	Yes	Yes	Yes
Nickel	7440-02-0	Yes	No	Yes	Yes	Yes	Yes
Aluminum	7429-90-5	Yes	No	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	No	Yes	Yes	Yes	Yes
Titanium	7440-32-6	Yes	No	No	No	Yes	No
Arsenic	7440-38-2	Yes	No	Yes	Yes	Yes	Yes
Boron	7440-42-8	No	No	No	No	Yes	No
Lead	7439-92-1	Yes	No	Yes	Yes	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	Yes	Yes
Cobalt	7440-48-4	Yes	No	Yes	Yes	Yes	Yes
Copper	7440-50-8	Yes	No	Yes	Yes	Yes	Yes
Vanadium	7440-62-2	Yes	No	Yes	No	Yes	Yes
Zirconium	7440-67-7	Yes	No	Yes	No	Yes	Yes
Calcium	7440-70-2	Yes	No	Yes	No	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.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

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.
 WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

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

Component	CAS #	Minimum Concentration
Iron	7439-89-6	1 % (related to Iron oxide)

Additional Regulatory Information A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Iron	7439-89-6	Yes	Yes	Yes
Carbon	7440-44-0	Yes	Yes	Yes
Silicon	7440-21-3	Yes	Yes	Yes
Molybdenum	7439-98-7	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes
Niobium	7440-03-1	Yes	Yes	Yes
Aluminum	7429-90-5	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes
Titanium	7440-32-6	Yes	Yes	Yes
Arsenic	7440-38-2	Yes	Yes	Yes
Boron	7440-42-8	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes
Chromium	7440-47-3	Yes	Yes	Yes
Cobalt	7440-48-4	Yes	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes
Vanadium	7440-62-2	Yes	Yes	Yes
Zirconium	7440-67-7	Yes	Yes	Yes
Calcium	7440-70-2	Yes	Yes	Yes

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

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NFPA = National Fire Protection Association; HMIS = High Efficiency Particulate Air; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act.

This is the end of MSDS # CIRON