Safety Data Sheet

Product Identifier: Stainless Steel Scrap **SDS ID : FE-0104**

* * *Section 1 - Identification* * *

Product Identifier: Stainless Steel Scrap

Chemical Family: Mixture
Recommended Use: Scrap metal usage.
Restriction on Use: None known.

Manufacturer Information

The David J. Joseph Company
300 Pike Street
Cincinnati, OH 45202

Non-Emergency Contact: Safety Department
Non-Emergency Phone: 513-419-6200
Emergency Contact: DJJ
Emergency Phone: 513-562-1699

* * *Section 2 - Hazard(s) Identification* * *

Classification in accordance with 29 CFR 1910.1200.

Product is supplied as scrap metal consisting of iron and nickel. This alloy is a non-combustible, non-reactive solid material. Solid material, as supplied, is not hazardous. Processing of this material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication). Dust, particles or powder generated during processing would have the following classification:

Acute Toxicity (Oral), Category 3
Skin Corrosion / Irritation, Category 2
Eye Damage / Irritation, Category 2A
Sensitization - Respiratory, Category 1
Sensitization - Skin, Category 1
Germ Cell Mutagenicity, Category 2
Carcinogenicity, Category 1A
Toxic to Reproduction, Category 1B
Specific Target Organ Toxicity - Single Exposure, Category 1 (kidneys, respiratory system)
Specific Target Organ Toxicity - Single Exposure, Category 2 (systemic toxicity)
Specific Target Organ Toxicity - Single Exposure, Category 3 (respiratory tract)
Specific Target Organ Toxicity - Repeated Exposure, Category 1 (respiratory system, liver, nervous system, lungs)

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statement(s)

Toxic if swallowed
Causes skin irritation

Causes serious eye irritation
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
Suspected of causing genetic defects
May cause cancer
May damage fertility or the unborn child
Causes damage to kidneys and respiratory system.
May cause respiratory irritation
May cause damage to systemic toxicity.
Causes damage to respiratory system, liver, nervous system, and lungs through prolonged or repeated exposure.

Precautionary Statement(s)

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, mist, fumes or vapors. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Do not eat, drink, or smoke when using this product. Wear appropriate protective gloves/clothing and eye/face protection if contact is possible. Contaminated work clothing should not be allowed out of the workplace. Wash thoroughly after handling.

Response

IF exposed or concerned: Get medical advice/attention. Specific treatment may be needed, see first aid section of Safety Data Sheet. IF INHALED: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before re-use. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.

Storage

Store in a secure area.

Disposal

Dispose of material in accordance with all local, regional, national and international regulations.

Hazard(s) Not Otherwise Classified

Dust may present an explosion hazard if allowed to accumulate in an industrial or manufacturing environment. Coatings and oils applied to the product may enhance flammability.

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

CAS	Component	Percent
7439-89-6	Iron	>45
7440-02-0	Nickel	<36
7440-47-3	Chromium	<27
7440-33-7	Tungsten	<20
7440-48-4	Cobalt	<12
7439-98-7	Molybdenum	<10
7440-62-2	Vanadium	<5
7429-90-5	Aluminum	<5
7439-96-5	Manganese	<5
7440-50-8	Copper	<5
7440-44-0	Carbon	<3
7440-21-3	Silicon	<3

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 material may produce hazardous vapors, fumes, mists and dusts which are considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

May contain trace amounts of boron, arsenic, lead, tin, niobium, zirconium, and calcium.

This data sheet is prepared as a guideline for typical uses of scrap materials. The user should be aware that the composition of the scrap 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 scrap 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 2 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* * *

Description of Necessary Measures

Inhalation

If adverse effects occur during processing, remove to uncontaminated area. Get immediate medical attention.

Skin Contact

Wash with plenty of soap and water. If skin irritation or rash occurs, seek medical advice/attention. Take off contaminated clothing and wash before re-use. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

Eye Contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention. In case of mechanical abrasions and cuts, seek medical attention immediately.

Ingestion

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting unless told to do so by the poison control center or doctor.

Most Important Symptoms/Effects

Acute

Processing by-products: Toxic if swallowed. Symptoms/effects may include respiratory tract irritation, skin irritation, eye irritation, asthma, allergic reactions, kidney damage, respiratory system damage, and systemic toxicity damage.

Delayed

Processing by-products: Symptoms/effects may include asthma, allergic reactions, mutagenic effects, cancer, reproductive effects, respiratory system damage, liver damage, and nervous system damage.

Indication of immediate Medical Attention and Special Treatment Needed

Treat symptomatically and supportively.

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

Extinguishing Media

Media to use includes regular dry chemical and dry sand.

Unsuitable Extinguishing Media

Molten metal may react violently with water.

Specific Hazards Arising from the Chemical

Coatings and oils applied to the product may enhance flammability. Dust or fine particles may present a flammability hazard if allowed to accumulate in an industrial or manufacturing environment.

Hazardous Combustion Products

This product may release metal oxide fumes by thermal decomposition.

Fire fighting measures

Fight fire with normal precautions from a reasonable distance. Cool materials with water spray until well after the fire is out.

Special Protective Equipment and Precautions for Firefighters

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

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

Personal Precautions, Protective Equipment and Emergency Procedures

If dusts or particulates are generated, eliminate sources of ignition. Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Containment of this material should not be necessary. If dusts or particulates are generated, eliminate sources of ignition. Small pieces of this product may be collected with a broom and shovel. Collect spilled material in appropriate container for reuse or disposal.

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

Precautions for Safe Handling

Observe good hygiene and safety practices when handling this product. Processing of this material may produce hazardous vapors, fumes, mists, and dusts. Avoid inhaling dusts or fumes produced during product processing. Handle with adequate ventilation during processing. Wash thoroughly after handling.

Condition for Safe storage, Including any incompatibilities

Store in a secure area.

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.

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

Exposure Limits

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

Component Exposure Limits

Iron (7439-89-6)

ACGIH:	5 mg/m3 TWA (respirable fraction, related to Iron oxide)
OSHA:	10 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction, related to Iron oxide)
NIOSH:	5 mg/m3 TWA (as Fe, dust and fume, related to Iron oxide)
Alberta:	5 mg/m3 TWA (respirable, related to Iron oxide)
British Columbia:	10 mg/m3 TWA (total particulate matter containing no Asbestos and <1% Crystalline silica, total particulate); 3 mg/m3 TWA (particulate matter containing no Asbestos and <1% Crystalline silica, respirable particulate); 5 mg/m3 TWA (as Fe, dust and fume, related to Iron oxide) 10 mg/m3 STEL (as Fe, fume, related to Iron oxide)
Manitoba:	5 mg/m3 TWA (respirable fraction, related to Iron oxide)
New Brunswick:	5 mg/m3 TWA (as Fe, particulate matter containing no Asbestos and <1% Crystalline silica, dust and fume); 10 mg/m3 TWA (regulated under Rouge, particulate matter containing no Asbestos and <1% Crystalline silica, related to Iron oxide)
NW Territories:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass, related to Iron oxide)
Nova Scotia:	5 mg/m3 TWA (respirable fraction, related to Iron oxide)
Nunavut:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass, related to Iron oxide)
Ontario:	5 mg/m3 TWA (respirable, related to Iron oxide)
Quebec:	5 mg/m3 TWAEV (as Fe, dust and fume); 10 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, regulated under Rouge, total dust, related to Iron oxide)
Saskatchewan:	5 mg/m3 TWA (as Fe, dust and fume); 10 mg/m3 TWA (regulated under Rouge, related to Iron oxide) 10 mg/m3 STEL (as Fe, dust and fume); 20 mg/m3 STEL (regulated under Rouge, related to Iron oxide)
Yukon:	5 mg/m3 TWA (as Fe2O3, fume); 30 mppcf TWA (regulated under Rouge); 10 mg/m3 TWA (regulated under Rouge, related to Iron oxide) 10 mg/m3 STEL (fume); 20 mg/m3 STEL (regulated under Rouge, related to Iron oxide)

Nickel (7440-02-0)

ACGIH:	1.5 mg/m3 TWA (inhalable fraction)
OSHA:	1 mg/m3 TWA
NIOSH:	0.015 mg/m3 TWA
Alberta:	1.5 mg/m3 TWA
British Columbia:	IARC Category 2B - Possible Human Carcinogen
	0.05 mg/m3 TWA
Manitoba:	1.5 mg/m3 TWA (inhalable fraction)
New Brunswick:	1 mg/m3 TWA
NW Territories:	1 mg/m3 TWA
	2 mg/m3 STEL
Nova Scotia:	1.5 mg/m3 TWA (inhalable fraction)
Nunavut:	1 mg/m3 TWA
	2 mg/m3 STEL
Ontario:	1 mg/m3 TWA (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

Chromium (7440-47-3)

ACGIH:	0.5 mg/m3 TWA
OSHA:	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 TWA
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

Tungsten (7440-33-7)

ACGIH:	5 mg/m3 TWA
	10 mg/m3 STEL
NIOSH:	5 mg/m3 TWA
	10 mg/m3 STEL
Alberta:	5 mg/m3 TWA
	10 mg/m3 STEL
British Columbia:	5 mg/m3 TWA
	10 mg/m3 STEL
Manitoba:	5 mg/m3 TWA
	10 mg/m3 STEL
NW Territories:	5 mg/m3 TWA
	10 mg/m3 STEL
Nova Scotia:	5 mg/m3 TWA
	10 mg/m3 STEL
Nunavut:	5 mg/m3 TWA
	10 mg/m3 STEL
Ontario:	5 mg/m3 TWA
	10 mg/m3 STEL
Saskatchewan:	5 mg/m3 TWA
	10 mg/m3 STEL
Yukon:	5 mg/m3 TWA
	10 mg/m3 STEL

Cobalt (7440-48-4)

ACGIH:	0.02 mg/m3 TWA
OSHA:	0.1 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
	0.02 mg/m3 TWA
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 TWA
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)

Molybdenum (7439-98-7)

ACGIH:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)
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 TWA (metal, inhalable); 3 mg/m3 TWA (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)

Manganese (7439-96-5)

ACGIH:	0.02 mg/m3 TWA (respirable fraction); 0.1 mg/m3 TWA (inhalable fraction)
OSHA:	5 mg/m3 Ceiling (fume)
NIOSH:	1 mg/m3 TWA (fume)
	3 mg/m3 STEL
Alberta:	0.2 mg/m3 TWA
British Columbia:	Adverse reproductive effect
	0.2 mg/m3 TWA
Manitoba:	0.02 mg/m3 TWA (respirable fraction); 0.1 mg/m3 TWA (inhalable fraction)
New Brunswick:	0.2 mg/m3 TWA
NW Territories:	1 mg/m3 TWA (fume)
	3 mg/m3 STEL (fume)
	5 mg/m3 Ceiling
Nova Scotia:	0.02 mg/m3 TWA (respirable fraction); 0.1 mg/m3 TWA (inhalable fraction)
Nunavut:	1 mg/m3 TWA (fume)
	3 mg/m3 STEL (fume)
	5 mg/m3 Ceiling
Ontario:	0.2 mg/m3 TWA
Quebec:	0.2 mg/m3 TWAEV (total dust and fume)
Saskatchewan:	0.2 mg/m3 TWA
	0.6 mg/m3 STEL
Yukon:	5 mg/m3 Ceiling

Aluminum (7429-90-5)

ACGIH:	1 mg/m3 TWA (respirable fraction)
OSHA:	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:	1 mg/m3 TWA (respirable)
Quebec:	10 mg/m3 TWAEV
Saskatchewan:	10 mg/m3 TWA (dust)
	20 mg/m3 STEL (dust)

Copper (7440-50-8)

ACGIH:	0.2 mg/m3 TWA (fume)
OSHA:	0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)
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)
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)
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 TWA (fume); 1 mg/m3 TWA (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:	0.5 mg/m3 Ceiling (as V2O5, respirable dust); 0.1 mg/m3 Ceiling (as V2O5, fume)
NIOSH:	1 mg/m3 TWA
	3 mg/m3 STEL

Silicon (7440-21-3)

OSHA:	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)
British Columbia:	10 mg/m3 TWA (total dust); 3 mg/m3 TWA (respirable fraction)
New Brunswick:	10 mg/m3 TWA
NW Territories:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass)
Nunavut:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass)
Ontario:	10 mg/m3 TWA (total dust)
Quebec:	10 mg/m3 TWAEV (containing no Asbestos and <1% Crystalline silica, total dust)
Saskatchewan:	10 mg/m3 TWA
	20 mg/m3 STEL
Yukon:	30 mppcf TWA; 10 mg/m3 TWA
	20 mg/m3 STEL

Appropriate Engineering Controls

For outdoor applications, special ventilation is not required under normal conditions of use. Under normal conditions of use, no special ventilation equipment is needed. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

Individual Protection Measures, such as Personal Protective Equipment

Eyes/Face Protection

Eye protection not required under normal conditions. Wear appropriate eye protection if eye contact is possible.

Skin Protection

Wear gloves and other clothing as required to avoid contact.

Respiratory Protection

Consult with a health and safety professional for specific respirators appropriate for your use. 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. Where concentrations exceed exposure limits or airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate for the material and its components.

General Information

Use good industrial hygiene practices in handling this material. Eye wash fountain and emergency showers are recommended.

* * *Section 9 - Physical and Chemical Properties* * *

Appearance:	Depends upon scrap composition, most often appears as a silver-white metal.	**Odor:**	Not available
Physical State:	Solid	**pH:**	Not applicable
Melting /Freezing Point:	2800 °F (1500 °C)	**Boiling Point:**	5400 °F (3000 °C)
Flash Point:	Not applicable	**Evaporation Rate:**	Not applicable
OSHA Flammability Class:	Non-flammable	**UFL:**	Not applicable
LFL:	Not applicable	**Vapor Pressure:**	Not applicable
Vapor Density:	Not applicable	**Specific Gravity:**	Not applicable
Bulk Density:	Not available	**Solubility (H2O):**	Insoluble
Auto Ignition:	Not applicable	**Viscosity:**	Not available

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

Reactivity

No reactivity hazard is expected.

Chemical Stability

Stable under normal conditions.

Possibility of Hazardous reaction

Will not occur.

Conditions to Avoid

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

Incompatible Materials

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 Products

Decomposition of this product may yield metallic oxides.

* * *Section 11 - Toxicological Information* * *

Acute Dose Effects

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, manganese, 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. Early signs of manganese poisoning are sluggishness, loss of appetite, sleepiness, weakness in the legs, uncontrollable laughter, hallucinations, delusions, spastic or slow gait, speech impairment, aggressiveness, tremor, mask-like faces, and clumsy movements. Overexposure to manganese may result in CNS effects, anemia and lung damage. 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. Repeated overexposure to high levels of aluminum oxide may lead to pulmonary fibrosis, a progressive lung disorder. 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. 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.

Component Analysis - LD50/LC50

Iron (7439-89-6)

Oral LD50 Rat 984 mg/kg

Nickel (7440-02-0)

Oral LD50 Rat >9000 mg/kg

Cobalt (7440-48-4)

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

Carbon (7440-44-0)

Oral LD50 Rat >10000 mg/kg

Information on Likely Routes of Exposure

Product contains trace levels (<0.1%) of components that may cause the following.

Inhalation

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.

Ingestion

Ingestion is not a likely route of exposure. Toxic if swallowed. 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..

Skin

Causes skin irritation. May cause an allergic skin reaction. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

Eye

Causes serious eye irritation. Dust or powder may irritate eye tissue. Rubbing may cause abrasion of cornea.

Immediate Effects

Processing by-products: Toxic if swallowed. Symptoms/effects may include respiratory tract irritation, skin irritation, eye irritation, asthma, allergic reactions, kidney damage, respiratory system damage, and systemic toxicity damage.

Delayed Effects

Processing by-products: Symptoms/effects may include asthma, allergic reactions, mutagenic effects, cancer, reproductive effects, respiratory system damage, liver damage, and nervous system damage.

Medical conditions Aggravated by Exposures

No data available.

Irritation/Corrosivity Data

May cause respiratory tract irritation, skin irritation, and eye irritation.

Respiratory Sensitizer

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Dermal Sensitization

May cause an allergic skin reaction.

Carcinogenicity

Component Carcinogenicity

Iron (7439-89-6)

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

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

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 humans))

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 49 [1990]; 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 carcinogenic to humans))

Manganese (7439-96-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Aluminum (7429-90-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Mutagenicity

Contains component(s) which may cause mutagenic effects.

Reproductive Toxicity

Available data characterizes components of this product as reproductive hazards.

Specific Target Organ Toxicity - Single Exposure

kidneys respiratory system systemic toxicity

Specific Target Organ Toxicity - Repeated Exposure

respiratory system liver nervous system

Aspiration Hazard

No data available.

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

Processing by-products: Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Component Analysis - Ecotoxicity - Aquatic Toxicity

Nickel (7440-02-0)

Duration/Test/Species	Concentration/Conditions/Notes
96 Hr LC50 Brachydanio rerio	>100 mg/L
96 Hr LC50 Cyprinus carpio	1.3 mg/L [semi-static]
96 Hr LC50 Cyprinus carpio	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]

Cobalt (7440-48-4)

Duration/Test/Species	Concentration/Conditions/Notes
96 Hr LC50 Brachydanio rerio	>100 mg/L [static]

Copper (7440-50-8)

Duration/Test/Species	Concentration/Conditions/Notes
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.

Persistence & Degradability

No information available for the product.

Bioaccumulation

No information available for the product.

Mobility

No information available for the product.

* * *Section 13 - Disposal Considerations* * *

Disposal Methods

Byproducts and residues from this product may be reprocessed or recycled. Recycle if possible. 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.

US EPA Waste Number & Descriptions

Component Waste Numbers

Chromium (7440-47-3)

RCRA: 5.0 mg/L regulatory level

Disposal of Contamiated Packaging

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

* * *Section 14 - Transportation Information* * *

US DOT Information

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 the products are shipped in quantities which exceed the reportable quantity (RQ) for individual components, they may also meet the requirements of DOT hazardous materials.

DOT Reportable Quantities

Nickel (7440-02-0)

100 lbs RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).); 45.4 kg RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).)

Chromium (7440-47-3)

5000 lbs RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).); 2270 kg RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).)

Copper (7440-50-8)

5000 lbs RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).); 2270 kg RQ (The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 µm (0.004 inches).)

TDG Information

Not regulated as a hazardous material.

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 (powder)

* * *Section 15 - Regulatory Information* * *

U.S. Federal Regulations

Processing of this material 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. This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

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 >100 µm); 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 >100 µm)

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 >100 µm); 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 >100 µm)

Cobalt (7440-48-4)

SARA 313: 0.1 % de minimis concentration

Manganese (7439-96-5)

SARA 313: 1.0 % de minimis concentration

Aluminum (7429-90-5)

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

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 >100 µm); 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 >100 µm)

Vanadium (7440-62-2)

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

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 (powder)

SARA 311/312 Hazardous Categories (40 CFR 370 Subparts B and C)

Acute Health Yes (dust/fumes) **Chronic Health** Yes (dust/fumes) **Fire** No **Pressure** No **Reactive** No

U.S. State Regulations

Other state regulations may apply. Check individual state requirements.

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]
Nickel	7440-02-0	Yes	No	Yes	Yes	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	Yes	Yes
Tungsten	7440-33-7	Yes	No	Yes	Yes	Yes	Yes
Cobalt	7440-48-4	Yes	No	Yes	Yes	Yes	Yes
Molybdenum	7439-98-7	Yes	No	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	No	Yes	Yes	Yes	Yes
Aluminum	7429-90-5	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
Silicon	7440-21-3	No	No	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.

Canada Regulation

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

Canadian WHMIS Information

Processing by-products: WHMIS CLASSIFICATION: D1A. D2A. D2B.

Component Analysis - WHMIS IDL

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

Iron (7439-89-6)

1 % (related to Iron oxide)

Nickel (7440-02-0)

0.1 %

Chromium (7440-47-3)

0.1 %

Tungsten (7440-33-7)

1 %

Cobalt (7440-48-4)

0.1 %

Molybdenum (7439-98-7)

1 %

Manganese (7439-96-5)

1 %

Aluminum (7429-90-5)

1 %

Copper (7440-50-8)

1 %

Vanadium (7440-62-2)

1 %

Additional Regulatory Information

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

Component Analysis - Inventory

Component	CAS #	TSCA	CAN
Iron	7439-89-6	Yes	DSL
Nickel	7440-02-0	Yes	DSL
Chromium	7440-47-3	Yes	DSL
Tungsten	7440-33-7	Yes	DSL
Cobalt	7440-48-4	Yes	DSL
Molybdenum	7439-98-7	Yes	DSL
Manganese	7439-96-5	Yes	DSL
Aluminum	7429-90-5	Yes	DSL
Copper	7440-50-8	Yes	DSL
Vanadium	7440-62-2	Yes	DSL
Silicon	7440-21-3	Yes	DSL
Carbon	7440-44-0	Yes	DSL

* * *Section 16 - Other Information* * *

Summary of Changes

Updated: 5/12/2015

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

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

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.

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.

MSDS History:

New MSDS: 7/8/1998
Revision 2/Regulatory Update: 7/19/2002
Revision 3/Regulatory Update: 10/6/2005
Revision 4/Regulatory Update: 8/7/2008
Revision 5/Regulatory Update: 1/26/2010
Revision 6 / Regulatory Update: 11/4/2011

End of Sheet FE-0104