

Material Safety Data Sheet

Material Name: Carbon Steel Scrap

ID: FE-0101

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

Chemical Name: Mixture

Product Use: Scrap metal usage.

Manufacturer Information

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

Contact: Dept. of Safety & Environmental Services
Phone: (513) 621-8770
Emergency # (800) 424-9300 - ChemTrec

*** Section 2 - Composition / Information on Ingredients ***

| CAS # | Component | Percent |
|-----------|------------|---------|
| 7439-89-6 | Iron | >96 |
| 7439-96-5 | Manganese | <2 |
| 7440-44-0 | Carbon | <2 |
| 7440-03-1 | Niobium | <0.1 |
| 7440-21-3 | Silicon | <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

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 below 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 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 III of this MSDS.

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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 3 - Hazards Identification ***

Emergency Overview

Product is supplied as scrap metal consisting of iron alloy. This 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 Reactivity: 0 Pers. Prot.: safety glasses with side shields, gloves

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

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

First Aid: Eyes

In cases of contact, flush eyes immediately with large amounts of water. 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. 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 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.

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

Flash Point: Not applicable

Upper Flammable Limit (UFL): Not available

Auto Ignition: Not applicable

Rate of Burning: Not applicable

General Fire Hazards

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.

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

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.

B: Component Exposure Limits

Iron (7439-89-6)

ACGIH: as Fe: 5 mg/m³ TWA (welding fumes, dust, total particulate (N.O.C.)) (related to Iron oxide)

OSHA: fume: 10 mg/m³ TWA (related to Iron oxide)

NIOSH: as Fe: 5 mg/m³ TWA (related to Iron oxide)

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Manganese (7439-96-5)

ACGIH: as Mn, 0.2 mg/m³ TWA

OSHA: fume, as Mn: 1 mg/m³ TWA
compounds, as Mn: C 5 mg/m³

NIOSH: as Mn: 1 mg/m³ TWA
3 mg/m³ STEL

Carbon (7440-44-0)

NIOSH: no established RELs - see Appendix D

Aluminum (7429-90-5)

ACGIH: metal dust, as Al: 10 mg/m³ TWA

OSHA: total dust, as Al: 15 mg/m³ TWA; respirable fraction, as Al: 5 mg/m³ TWA

NIOSH: total: 10 mg/m³ TWA; respirable dust: 5 mg/m³ TWA; pyro powders and welding fumes: 5 mg/m³ TWA; soluble salts and alkyls: 2 mg/m³ TWA

Molybdenum (7439-98-7)

ACGIH: soluble compounds, as Mo: 5 mg/m³ TWA; insoluble compounds, as Mo: 10 mg/m³ TWA

OSHA: soluble compounds, as Mo: 5 mg/m³ TWA; insoluble compounds (total dust), as Mo: 10 mg/m³ TWA

NIOSH: as Mo: no established RELs - see Appendix D

Nickel (7440-02-0)

ACGIH: metal: (1) mg/m³ TWA

OSHA: 1 mg/m³ TWA

NIOSH: as Ni: 0.015 mg/m³ TWA; NIOSH Potential Occupational Carcinogen - see Appendix A

Silicon (7440-21-3)

ACGIH: 10 mg/m³ TWA (The value is for total dust containing no asbestos and <1% crystalline silica)

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

NIOSH: total: 10 mg/m³ TWA; respirable dust: 5 mg/m³ TWA

Tin (7440-31-5)

ACGIH: metal: 2 mg/m³ TWA
0.2 mg/m³ STEL

skin - potential for cutaneous absorption

OSHA: inorganic compounds (except oxides), as Sn: 2 mg/m³ TWA; organic compounds, as Sn: 0.1 mg/m³ TWA
organic compounds: Prevent or reduce skin absorption

NIOSH: as Sn: 2 mg/m³ TWA

Arsenic (7440-38-2)

ACGIH: elemental, as As: 0.01 mg/m³ TWA

OSHA: organic compounds, as As: 0.5 mg/m³ TWA

NIOSH: NIOSH Potential Occupational Carcinogen - see Appendix A (organic compounds have no established exposure limit)
C 0.002 mg/m³ (15 min)

Lead (7439-92-1)

ACGIH: 0.05 mg/m³ TWA

OSHA: as Pb: 50 ug/m³ TWA PEL; 30 ug/m³ action level; Poison (see 29 CFR 1910.1025)

NIOSH: as Pb: 0.100 mg/m³ TWA; see Appendix C for supplementary exposure limits

Chromium (7440-47-3)

ACGIH: 0.5 mg/m³ TWA

OSHA: (as Cr): 1 mg/m³ TWA

NIOSH: as Cr: 0.5 mg/m³ TWA; see Appendix C for supplementary exposure limits

Cobalt (7440-48-4)

ACGIH: elemental, as Co: 0.02 mg/m³ TWA

OSHA: as Co: 0.05 mg/m³ TWA

NIOSH: as Co: 0.05 mg/m³ TWA

Copper (7440-50-8)

ACGIH: fume: (0.2) mg/m³ TWA; dusts and mists, as Cu: (1) mg/m³ TWA

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OSHA: fume, as Cu: 0.1 mg/m³ TWA
NIOSH: as Cu: 1 mg/m³ TWA (dusts and mists); 0.1 mg/m³ TWA (fume)
Zirconium (7440-67-7)
ACGIH: 5 mg/m³ TWA
as Zr: 10 mg/m³ STEL
OSHA: as Zr: 5 mg/m³ TWA
as Zr: 10 mg/m³ STEL
NIOSH: as Zr: 5 mg/m³ TWA
10 mg/m³ 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/MSHA 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: Depends upon scrap composition, most often appears as a silver-white metal. | Odor: Not available |
| Physical State: Solid | pH: Not applicable |
| Vapor Pressure: Not applicable | Vapor Density: Not applicable |
| Boiling Point: 5400 deg F (3000 deg C) | Melting Point: 2800 deg F (1500 deg C) |
| Solubility (H₂O): Insoluble | Specific Gravity: 8 |

*** 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.

Hazardous Polymerization

Will not occur.

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*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

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, 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. Aluminum soluble compounds, when ingested or inhaled, may have neurotoxic effects evidently due to the metal binding to nervous tissue. 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 periperal 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: 30 gm/kg

Manganese (7439-96-5)

Oral LD50 Rat: 9 gm/kg

Silicon (7440-21-3)

Oral LD50 Rat: 3160 mg/kg

Arsenic (7440-38-2)

Oral LD50 Rat: 763 mg/kg

Oral LD50 Mouse: 145 mg/kg

Boron (7440-42-8)

Oral LD50 Mouse: 560 mg/kg

Oral LD50 Rat: 650 mg/kg

Cobalt (7440-48-4)

Oral LD50 Rat: 6171 mg/kg

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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.

B: Component Carcinogenicity

Iron (7439-89-6)

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

IARC: Monograph 1, Supplement 7; 1987 (related to Iron oxide) (Group 3 (not classifiable))

Nickel (7440-02-0)

NIOSH: occupational carcinogen

NTP: suspect carcinogen (Listed under 'Nickel and certain nickel compounds') (Possible Select Carcinogen)

IARC: Monograph 49; 1990 (and alloys) (Group 2B (sufficient animal data))

Arsenic (7440-38-2)

ACGIH: elemental, as As: A1-confirmed human carcinogen

NIOSH: occupational carcinogen

NTP: known carcinogen (Listed under 'Arsenic and certain arsenic compounds') (Select Carcinogen)

IARC: [present] This evaluation applies to the group of chemicals as a whole and not necessarily to all individual chemicals within the group. (Group 1 (carcinogenic to humans))

Lead (7439-92-1)

ACGIH: elemental, as Pb; A3 - animal carcinogen

OSHA: as Pb: 50 ug/m3 TWA PEL; 30 ug/m3 action level; Poison (see 29 CFR 1910.1025)

IARC: Monograph 23, Supplement 7; 1987 (and lead compounds; evaluated as a group) (Group 2B (sufficient animal data))

Chromium (7440-47-3)

ACGIH: A4-not classifiable as a human carcinogen

IARC: Monograph 49; 1990 (Group 3 (not classifiable))

Cobalt (7440-48-4)

ACGIH: elemental, as Co: A3-animal carcinogen

IARC: Monograph 52; 1991 (and cobalt compounds; evaluated as a group) (Group 2B (sufficient animal data))

Zirconium (7440-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Epidemiology

No information available for the product.

Neurotoxicity

No information available for the product. Chronic overexposure to manganese compounds may result in CNS effects such as weakness, sleepiness, emotional instability and spastic gait. These effects can be permanent. 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.

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.

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Teratogenicity

No information available for the product. Manganese and aluminum have been shown to have teratogenic effects.

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. 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.

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

Aluminum (7429-90-5)

EC50 (48 hr) water flea: 1.4 mg/L.

Arsenic (7440-38-2)

LC50 (96 hr) rainbow trout: 13.34 mg/L. Cond: Static.; LC50 (96 hr) fathead minnow: 15.66 mg/L. Cond: Flow-through.; LC50 (96 hr) bluegill (juvenile): 41.76 mg/L. Cond: Flow-through; EC50 (48 hr) water flea: 3.80-5.28 mg/L. Cond: 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: waste number D004; regulatory level = 5.0 mg/L

Lead (7439-92-1)

RCRA: waste number D008; regulatory level = 5.0 mg/L

Chromium (7440-47-3)

RCRA: waste number D007; regulatory level = 5.0 mg/L

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.

*** 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.

Hazard Class: Not available.

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UN/NA #: 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

This product is 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).

Manganese (7439-96-5)

SARA 313: form R reporting required for 1.0% de minimus concentration

Aluminum (7429-90-5)

SARA 313: form R reporting required for 1.0% de minimus concentration (fume or dust only)

Nickel (7440-02-0)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 100 pounds (45.4 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Arsenic (7440-38-2)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 1 pound (0.454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal release is equal to or exceeds 0.004 inches)

Lead (7439-92-1)

SARA 313: form R reporting required for 0.1% de minimus concentration

CERCLA: final RQ = 10 pounds (4.54 kg)

Chromium (7440-47-3)

SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous material is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Cobalt (7440-48-4)

SARA 313: form R reporting required for 0.1% de minimus concentration

Copper (7440-50-8)

SARA 313: form R reporting required for 1.0% de minimus concentration

CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Vanadium (7440-62-2)

SARA 313: form R reporting required for 1.0% de minimus concentration (only fume or dust)

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

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

B: Component Analysis - State

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

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| Component | CAS # | CA | FL | MA | MN | NJ | PA |
|--------------------------------|-----------|-----|------|------|------|------|------|
| Iron (¹ related to Iron oxide) | 7439-89-6 | Yes | Yes¹ | Yes¹ | Yes¹ | Yes¹ | Yes¹ |
| Manganese | 7439-96-5 | Yes | Yes | Yes | Yes | Yes | Yes |
| Aluminum | 7429-90-5 | Yes | Yes | Yes | Yes | Yes | Yes |
| Molybdenum | 7439-98-7 | Yes | Yes | Yes | Yes | Yes | Yes |
| Nickel | 7440-02-0 | Yes | Yes | Yes | Yes | Yes | Yes |
| Silicon | 7440-21-3 | No | No | Yes | Yes | Yes | Yes |
| Tin | 7440-31-5 | Yes | Yes | Yes | Yes | Yes | Yes |
| Titanium | 7440-32-6 | Yes | No | No | No | Yes | No |
| Arsenic | 7440-38-2 | Yes | Yes | Yes | Yes | Yes | Yes |
| Lead | 7439-92-1 | Yes | Yes | Yes | Yes | Yes | Yes |
| Chromium | 7440-47-3 | Yes | Yes | Yes | Yes | Yes | Yes |
| Cobalt | 7440-48-4 | Yes | Yes | Yes | Yes | Yes | Yes |
| Copper | 7440-50-8 | Yes | Yes | Yes | Yes | Yes | Yes |
| Vanadium | 7440-62-2 | Yes | No | Yes | No | Yes | Yes |
| Zirconium | 7440-67-7 | Yes | Yes | Yes | Yes | Yes | Yes |
| Calcium | 7440-70-2 | Yes | Yes | 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.

Other Regulations

A: General Product Information

No information available for the product.

B: Component Analysis - Inventory

| Component | CAS # | TSCA | DSL | EINECS |
|------------|-----------|------|-----|--------|
| Iron | 7439-89-6 | Yes | Yes | Yes |
| Manganese | 7439-96-5 | Yes | Yes | Yes |
| Carbon | 7440-44-0 | Yes | Yes | Yes |
| Aluminum | 7429-90-5 | Yes | Yes | Yes |
| Molybdenum | 7439-98-7 | Yes | Yes | Yes |
| Nickel | 7440-02-0 | Yes | Yes | Yes |
| Niobium | 7440-03-1 | Yes | Yes | Yes |
| Silicon | 7440-21-3 | 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 |

C: Component Analysis - WHMIS IDL

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

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| Component | CAS # | Minimum Concentration |
|-----------|-----------|--|
| Iron | 7439-89-6 | 1% item 762 (1327) (related to Iron oxide) |
| Manganese | 7439-96-5 | 1% item 974 (1077) |

***** 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 # FE-0101