

# Material Safety Data Sheet

Material Name: Steel Mill Electric Arc Furnace Dust

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

**Manufacturer Information**

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

Phone: (800) 876-3626

Emergency # 800-424-9300 CHEMTREC

**\*\*\* Section 2 - Hazards Identification \*\*\***

**Emergency Overview**

Inhalation of fumes may result metal fume fever, irritation to eyes, mucous membranes and respiratory system, pneumonia, bronchitis, sinusitis, laryngitis, chest pain, conjunctivitis, gingivitis, cardiopulmonary arrest. Skin exposure may result in dermatitis and skin lesions.

**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 may contain levels 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 may contain levels of components that may cause allergic respiratory sensitization and cancer. Normal use of this product should not generate fumes. Dusts, vapors, and fumes generated during processing may irritate the respiratory system. 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 HMIS Reactivity 0**

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

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

CAS #	Component	Percent
1309-37-1	Iron oxide	0-35
1305-78-8	Calcium oxide	0-35
1314-13-2	Zinc oxide	0-25
14464-46-1	Silica, cristobalite	0-15
7439-96-5	Manganese	5-10
1309-48-4	Magnesium oxide fume	5-10
7440-31-5	Tin	0-5
1344-28-1	Aluminum oxide	0-5
7440-47-3	Chromium	0-5
1314-56-3	Phosphorus pentoxide	0-5
7446-09-5	Sulfur dioxide	0-5
7789-75-5	Calcium fluoride (CaF <sub>2</sub> )	0-5
7782-41-4	Fluorine	0-5
7439-98-7	Molybdenum	0-5
7440-22-4	Silver	0-5
1314-62-1	Vanadium pentoxide	0-5
7440-38-2	Arsenic	0-5

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7440-48-4	Cobalt	0-5
13463-67-7	Titanium dioxide	0-5
1310-58-3	Potassium hydroxide	0-5
7440-39-3	Barium	0-5
1306-19-0	Cadmium oxide	0-5
7439-92-1	Lead	0-5
7440-33-7	Tungsten	0-5
7439-97-6	Mercury	0-5
7440-02-0	Nickel	0-5
7782-49-2	Selenium	0-5
7440-50-8	Copper	0-5

## \*\*\* Section 4 - First Aid Measures \*\*\*

### First Aid: Eyes

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

### 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

Seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

### First Aid: Inhalation

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

## \*\*\* 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 oil residue on the product may enhance flammability. Keep product damp to minimize fire hazards.

### Hazardous Combustion Products

Fire or thermal processing may release products of hydrocarbon decomposition and metal fumes.

### Extinguishing Media

Use appropriate extinguishing media for surrounding fire.

### 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

Prevent release to air, sinks, drains, sewers, or water runoff.

### Clean-Up Procedures

Dust should be swept up and placed in suitable container.

### Evacuation Procedures

None necessary.

### Special Procedures

None

## \*\*\* 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.

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## Storage Procedures

Keep this material in a well-ventilated area. Keep this material slightly damp to avoid fire hazards.

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

### A: Component Exposure Limits

#### Calcium oxide (1305-78-8)

ACGIH: 2 mg/m3 TWA  
OSHA: 5 mg/m3 TWA (not in effect as a result of reconsideration)  
NIOSH: 2 mg/m3 TWA

#### Iron oxide (1309-37-1)

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

#### Zinc oxide (1314-13-2)

ACGIH: 2 mg/m3 TWA (respirable fraction)  
10 mg/m3 STEL (respirable fraction)  
OSHA: 5 mg/m3 TWA (fume); 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)  
10 mg/m3 STEL (fume)  
NIOSH: 5 mg/m3 TWA (dust and fume)  
10 mg/m3 STEL (fume)  
15 mg/m3 Ceiling (dust)

#### Magnesium oxide fume (1309-48-4)

ACGIH: 10 mg/m3 TWA (inhalable fraction)  
OSHA: 10 mg/m3 TWA (total particulate)

#### Silica, cristobalite (14464-46-1)

ACGIH: 0.025 mg/m3 TWA (respirable fraction)  
OSHA: 0.05 mg/m3 TWA (respirable dust)  
NIOSH: 0.05 mg/m3 TWA (respirable dust)

#### Manganese (7439-96-5)

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

#### Vanadium pentoxide (1314-62-1)

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

#### Aluminum oxide (1344-28-1)

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

#### Titanium dioxide (13463-67-7)

ACGIH: 10 mg/m3 TWA  
OSHA: 10 mg/m3 TWA (total dust)

#### Potassium hydroxide (1310-58-3)

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

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## Lead (7439-92-1)

ACGIH: 0.05 mg/m3 TWA  
OSHA: 50 µg/m3 TWA (as Pb); 30 µg/m3 Action Level (as Pb, Poison - see 29 CFR 1910.1025)  
NIOSH: 0.050 mg/m3 TWA

## Mercury (7439-97-6)

ACGIH: 0.025 mg/m3 TWA  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 0.05 mg/m3 TWA (vapor)  
0.03 mg/m3 STEL  
0.1 mg/m3 Ceiling  
Prevent or reduce skin absorption (all forms)  
NIOSH: 0.05 mg/m3 TWA (vapor)  
0.1 mg/m3 Ceiling  
Potential for dermal absorption

## Molybdenum (7439-98-7)

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

## Nickel (7440-02-0)

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

## Silver (7440-22-4)

ACGIH: 0.1 mg/m3 TWA (dust and fume)  
OSHA: 0.01 mg/m3 TWA  
NIOSH: 0.01 mg/m3 TWA (dust)

## Tin (7440-31-5)

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

## Tungsten (7440-33-7)

ACGIH: 5 mg/m3 TWA  
10 mg/m3 STEL  
OSHA: 5 mg/m3 TWA  
10 mg/m3 STEL  
NIOSH: 5 mg/m3 TWA  
10 mg/m3 STEL

## Arsenic (7440-38-2)

ACGIH: 0.01 mg/m3 TWA  
OSHA: 0.5 mg/m3 TWA  
NIOSH: 0.002 mg/m3 Ceiling (15 min)

## Barium (7440-39-3)

ACGIH: 0.5 mg/m3 TWA  
OSHA: 0.5 mg/m3 TWA

## Chromium (7440-47-3)

ACGIH: 0.5 mg/m3 TWA  
OSHA: 1 mg/m3 TWA  
NIOSH: 0.5 mg/m3 TWA

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## Cobalt (7440-48-4)

ACGIH: 0.02 mg/m3 TWA  
OSHA: 0.05 mg/m3 TWA (dust and fume)  
NIOSH: 0.05 mg/m3 TWA (dust and fume)

## Copper (7440-50-8)

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

## Sulfur dioxide (7446-09-5)

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

## Fluorine (7782-41-4)

ACGIH: 1 ppm TWA  
2 ppm STEL  
OSHA: 0.1 ppm TWA; 0.2 mg/m3 TWA  
NIOSH: 0.1 ppm TWA; 0.2 mg/m3 TWA

## Selenium (7782-49-2)

ACGIH: 0.2 mg/m3 TWA  
OSHA: 0.2 mg/m3 TWA  
NIOSH: 0.2 mg/m3 TWA

## 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 \* \* \*

<b>Appearance:</b>	Brown granular or powder	<b>Odor:</b>	None
<b>Physical State:</b>	Solid	<b>pH:</b>	NA
<b>Vapor Pressure:</b>	NA	<b>Vapor Density:</b>	NA
<b>Boiling Point:</b>	±5000°F	<b>Melting Point:</b>	±2800°F
<b>Solubility (H2O):</b>	Insoluble	<b>Specific Gravity:</b>	0-8-5.5
<b>Evaporation Rate:</b>	NA	<b>VOC:</b>	NA
<b>Octanol/H2O Coeff.:</b>		<b>Flash Point:</b>	NA
<b>Flash Point Method:</b>	NA	<b>Upper Flammability Limit (UFL):</b>	NA
<b>Lower Flammability Limit (LFL):</b>	NA	<b>Burning Rate:</b>	NA
<b>Auto Ignition:</b>	NA		

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

### Chemical Stability

This is a stable material.

### Chemical Stability: Conditions to Avoid

N/A

### Incompatibility

Calcium hypochlorite, performic acid, finely divided aluminum, ethylene oxide and bromine pentafluoride.

### Hazardous Decomposition

Lead, cadmium and zinc boil off at high temperatures.

### Possibility of Hazardous Reactions

Will not occur.

## \*\*\* Section 11 - Toxicological Information \*\*\*

### Acute Dose Effects

#### A: General Product Information

Exposure to dusts or fumes from some metals including zinc, manganese, chromium, cobalt and copper can produce a condition known as metal fume fever. Zinc poisoning can cause anemia, lethargy and dizziness. 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. May also 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. 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. Exposure to nickel compounds may also result in allergic lung sensitization. Exposure to copper fume or dust can cause respiratory tract irritation, hemolytic anemia and allergic contact dermatitis. 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. Cadmium is a cancer suspect agent. May cause lung, kidney and liver damage. Causes digestive and respiratory tract irritation. May cause reproductive and fetal effect.

#### B: Component Analysis - LD50/LC50

##### Calcium oxide (1305-78-8)

Oral LD50 Rat: 500 mg/kg

##### Iron oxide (1309-37-1)

Oral LD50 Rat: >10000 mg/kg

##### Zinc oxide (1314-13-2)

Oral LD50 Rat: >5000 mg/kg

##### Manganese (7439-96-5)

Oral LD50 Rat: 9 g/kg

##### Phosphorus pentoxide (1314-56-3)

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Inhalation LC50 Rat: 1.22 mg/L/1H

**Vanadium pentoxide (1314-62-1)**

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

**Aluminum oxide (1344-28-1)**

Oral LD50 Rat: >5000 mg/kg

**Titanium dioxide (13463-67-7)**

Oral LD50 Rat: >10000 mg/kg

**Potassium hydroxide (1310-58-3)**

Oral LD50 Rat: 214 mg/kg

**Cadmium oxide (1306-19-0)**

Oral LD50 Rat: 72 mg/kg; Inhalation LC50 Rat:45 mg/m3/1H

**Nickel (7440-02-0)**

Oral LD50 Rat: >9000 mg/kg

**Silver (7440-22-4)**

Oral LD50 Rat: >2000 mg/kg

**Arsenic (7440-38-2)**

Oral LD50 Rat: 763 mg/kg

**Cobalt (7440-48-4)**

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

**Sulfur dioxide (7446-09-5)**

Inhalation LC50 Rat: 2500 ppm/1H

**Fluorine (7782-41-4)**

Inhalation LC50 Rat: 185 ppm/1H

**Selenium (7782-49-2)**

Oral LD50 Rat: 6700 mg/kg

**Calcium fluoride (CaF<sub>2</sub>) (7789-75-5)**

Oral LD50 Rat: 4250 mg/kg

## Carcinogenicity

### A: General Product Information

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. Studies indicate workers exposed to cadmium have an increased rate of prostate and respiratory tract cancer.

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## B: Component Carcinogenicity

### Iron oxide (1309-37-1)

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

### Magnesium oxide fume (1309-48-4)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

### Silica, cristobalite (14464-46-1)

ACGIH: A2 - Suspected Human Carcinogen  
NIOSH: potential occupational carcinogen  
IARC: Monograph 68 [1997] (listed under Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources) (Group 1 (carcinogenic to humans))

### Vanadium pentoxide (1314-62-1)

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

### Titanium dioxide (13463-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen  
NIOSH: potential occupational carcinogen  
IARC: Monograph 93 [in preparation], Monograph 47 [1989] (Group 2B (possibly carcinogenic to humans))

### Lead (7439-92-1)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans  
OSHA: 50 µg/m<sup>3</sup> TWA (as Pb); 30 µg/m<sup>3</sup> Action Level (as Pb, Poison - see 29 CFR 1910.1025)  
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))

### Cadmium oxide (1306-19-0)

NIOSH: potential occupational carcinogen  
IARC: Monograph 58 [1993] (listed under Cadmium and Cadmium Compounds) (Group 1 (carcinogenic to humans))

### Mercury (7439-97-6)

ACGIH: A4 - Not Classifiable as a Human Carcinogen  
IARC: Monograph 58 [1993] (Group 3 (not classifiable))

### Nickel (7440-02-0)

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

### Arsenic (7440-38-2)

ACGIH: A1 - Confirmed Human Carcinogen  
NIOSH: potential occupational carcinogen  
IARC: Monograph 84 [2004] (in drinking water), Supplement 7 [1987], Monograph 23 [1980] (Group 1 (carcinogenic to humans))

### Barium (7440-39-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

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## **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

IARC: Monograph 86 [2006] (without tungsten carbide), Monograph 52 [1991] (Group 2B (possibly carcinogenic to humans))

## **Sulfur dioxide (7446-09-5)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 54 [1992] (Group 3 (not classifiable))

## **Selenium (7782-49-2)**

IARC: Supplement 7 [1987], Monograph 9 [1975] (Group 3 (not classifiable))

## **Mutagenicity**

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**

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. Excessive zinc levels have been reported to be associated with increased risk for neural tube defects. 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**

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.

## **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**

##### **Calcium oxide (1305-78-8)**

###### **Test & Species**

96 Hr LC50 Cyprinus carpio

1070 mg/L [static]

###### **Conditions**

##### **Potassium hydroxide (1310-58-3)**

###### **Test & Species**

24 Hr LC50 Gambusia affinis

80.0 mg/L

###### **Conditions**

##### **Lead (7439-92-1)**

###### **Test & Species**

96 Hr LC50 Pimephales promelas

6.5 mg/L

48 Hr EC50 water flea

600 µg/L

###### **Conditions**

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## Mercury (7439-97-6)

### Test & Species

96 Hr LC50 Oncorhynchus mykiss	0.16 mg/L
96 Hr LC50 Lepomis macrochirus	0.16 mg/L
96 Hr EC50 water flea	5.0 µg/L

### Conditions

## Nickel (7440-02-0)

### Test & Species

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

### Conditions

adult

## Silver (7440-22-4)

### Test & Species

96 Hr LC50 Pimephales promelas	5.6-7.4 µg/L [flow-through]
96 Hr LC50 Pimephales promelas	9.4-9.7 µg/L [static]
96 Hr LC50 Oncorhynchus mykiss	0.0076 mg/L
96 Hr LC50 Lepomis macrochirus	24.2-48.4 µg/L
48 Hr EC50 Daphnia magna	0.9 µg/L
96 Hr LC50 Daphnia magna	5 µg/L
96 Hr LC50 Hyalella azteca	1.4-2.3 µg/L

### Conditions

## Cobalt (7440-48-4)

### Test & Species

96 Hr LC50 Brachydanio rerio	>100 mg/L [static]
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### Conditions

## Copper (7440-50-8)

### Test & Species

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

### Conditions

## \*\*\* Section 13 - Disposal Considerations \*\*\*

### US EPA Waste Number & Descriptions

#### Component Waste Numbers

##### Vanadium pentoxide (1314-62-1)

RCRA: waste number P120

##### Lead (7439-92-1)

RCRA: 5.0 mg/L regulatory level

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**Mercury (7439-97-6)**

RCRA: waste number U151  
0.2 mg/L regulatory level

**Silver (7440-22-4)**

RCRA: 5.0 mg/L regulatory level

**Arsenic (7440-38-2)**

RCRA: 5.0 mg/L regulatory level

**Barium (7440-39-3)**

RCRA: 100.0 mg/L regulatory level

**Chromium (7440-47-3)**

RCRA: 5.0 mg/L regulatory level

**Fluorine (7782-41-4)**

RCRA: waste number P056

**Selenium (7782-49-2)**

RCRA: 1.0 mg/L regulatory level

## Disposal Instructions

Byproducts and residues from this product may be reprocessed or recycled. Whatever cannot be recycled should be managed in an appropriate and approved waste disposal facility. Dispose in accordance to local, state, and federal regulations.

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

* * * <b>Section 14 - Transportation Information</b> * * *
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## US DOT Information

**Shipping Name:** Not Regulated

## TDG Information

**Shipping Name:** Not Regulated

* * * <b>Section 15 - Regulatory Information</b> * * *
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## US Federal Regulations

### A: Component Analysis

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

**Manganese (7439-96-5)**

SARA 313: 1.0 % de minimis concentration

**Vanadium pentoxide (1314-62-1)**

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

CERCLA: 1000 lb final RQ; 454 kg final RQ

**Aluminum oxide (1344-28-1)**

SARA 313: 1.0 % de minimis concentration (fibrous forms)

**Potassium hydroxide (1310-58-3)**

CERCLA: 1000 lb final RQ; 454 kg final RQ

# Material Safety Data Sheet

**Material Name: Steel Mill Electric Arc Furnace Dust**

## **Lead (7439-92-1)**

SARA 313: 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)

## **Cadmium oxide (1306-19-0)**

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

## **Mercury (7439-97-6)**

SARA 313: 1.0 % Supplier notification limit

CERCLA: 1 lb final RQ; 0.454 kg final RQ

## **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)

## **Silver (7440-22-4)**

SARA 313: 1.0 % de minimis concentration

CERCLA: 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is larger than 100 micrometers); 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is larger than 100 micrometers)

## **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 release is larger than 100 micrometers)

## **Barium (7440-39-3)**

SARA 313: 1.0 % de minimis concentration

## **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)

# Material Safety Data Sheet

**Material Name: Steel Mill Electric Arc Furnace Dust**

**Sulfur dioxide (7446-09-5)**

SARA 302: 500 lb TPQ

**Fluorine (7782-41-4)**

SARA 302: 500 lb TPQ

SARA 313: 1.0 % de minimis concentration

CERCLA: 10 lb final RQ; 4.54 kg final RQ

**Selenium (7782-49-2)**

SARA 313: 1.0 % 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)

**B: Component Marine Pollutants**

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

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

**State Regulations**

**A: General Product Information**

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	MA	MN	NJ	PA	RI
Calcium oxide	1305-78-8	Yes	Yes	Yes	Yes	Yes	Yes
Iron oxide	1309-37-1	Yes	Yes	Yes	Yes	Yes	Yes
Zinc oxide	1314-13-2	Yes	Yes	Yes	Yes	Yes	Yes
Magnesium oxide fume	1309-48-4	Yes	Yes	Yes	Yes	Yes	Yes
Silica, cristobalite	14464-46-1	No	Yes	Yes	Yes	Yes	No
Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Phosphorus pentoxide	1314-56-3	No	Yes	No	Yes	Yes	No
Vanadium pentoxide	1314-62-1	Yes	Yes	Yes	Yes	Yes	Yes
Aluminum oxide	1344-28-1	Yes	Yes	Yes	Yes	Yes	Yes
Titanium dioxide	13463-67-7	No	Yes	Yes	Yes	Yes	Yes
Potassium hydroxide	1310-58-3	Yes	Yes	Yes	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes	Yes	Yes	Yes
Cadmium oxide	1306-19-0	Yes	Yes	Yes	Yes	Yes	Yes
Mercury	7439-97-6	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
Silver	7440-22-4	Yes	Yes	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	Yes	Yes
Tungsten	7440-33-7	Yes	Yes	Yes	Yes	Yes	Yes
Arsenic	7440-38-2	Yes	Yes	Yes	Yes	Yes	Yes
Barium	7440-39-3	No	Yes	No	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
Sulfur dioxide	7446-09-5	Yes	Yes	Yes	Yes	Yes	Yes
Fluorine	7782-41-4	Yes	Yes	Yes	Yes	Yes	Yes
Selenium	7782-49-2	Yes	Yes	No	Yes	Yes	Yes

# Material Safety Data Sheet

**Material Name: Steel Mill Electric Arc Furnace Dust**

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
Calcium oxide	1305-78-8	1 %
Iron oxide	1309-37-1	1 %
Zinc oxide	1314-13-2	1 %
Magnesium oxide fume	1309-48-4	1 %
Silica, cristobalite	14464-46-1	1 %
Manganese	7439-96-5	1 %
Phosphorus pentoxide	1314-56-3	1 %
Vanadium pentoxide	1314-62-1	0.1 %
Aluminum oxide	1344-28-1	1 %
Potassium hydroxide	1310-58-3	1 %
Lead	7439-92-1	0.1 %
Cadmium oxide	1306-19-0	0.1 %
Mercury	7439-97-6	0.1 %
Molybdenum	7439-98-7	1 %
Nickel	7440-02-0	0.1 %
Silver	7440-22-4	1 %
Tin	7440-31-5	1 %
Tungsten	7440-33-7	1 %
Arsenic	7440-38-2	0.1 %
Chromium	7440-47-3	0.1 %
Cobalt	7440-48-4	0.1 %
Copper	7440-50-8	1 %
Sulfur dioxide	7446-09-5	1 %
Fluorine	7782-41-4	1 %
Selenium	7782-49-2	0.1 %

## Additional Regulatory Information

### A: General Product Information

No information available for the product.

# Material Safety Data Sheet

**Material Name: Steel Mill Electric Arc Furnace Dust**

## B: Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Calcium oxide	1305-78-8	Yes	DSL	EINECS
Iron oxide	1309-37-1	Yes	DSL	EINECS
Zinc oxide	1314-13-2	Yes	DSL	EINECS
Magnesium oxide fume	1309-48-4	Yes	DSL	EINECS
Silica, cristobalite	14464-46-1	Yes	DSL	EINECS
Manganese	7439-96-5	Yes	DSL	EINECS
Phosphorus pentoxide	1314-56-3	Yes	DSL	EINECS
Vanadium pentoxide	1314-62-1	Yes	DSL	EINECS
Aluminum oxide	1344-28-1	Yes	DSL	EINECS
Titanium dioxide	13463-67-7	Yes	DSL	EINECS
Potassium hydroxide	1310-58-3	Yes	DSL	EINECS
Lead	7439-92-1	Yes	DSL	EINECS
Cadmium oxide	1306-19-0	Yes	DSL	EINECS
Mercury	7439-97-6	Yes	DSL	EINECS
Molybdenum	7439-98-7	Yes	DSL	EINECS
Nickel	7440-02-0	Yes	DSL	EINECS
Silver	7440-22-4	Yes	DSL	EINECS
Tin	7440-31-5	Yes	DSL	EINECS
Tungsten	7440-33-7	Yes	DSL	EINECS
Arsenic	7440-38-2	Yes	DSL	EINECS
Barium	7440-39-3	Yes	DSL	EINECS
Chromium	7440-47-3	Yes	DSL	EINECS
Cobalt	7440-48-4	Yes	DSL	EINECS
Copper	7440-50-8	Yes	DSL	EINECS
Sulfur dioxide	7446-09-5	Yes	DSL	EINECS
Fluorine	7782-41-4	Yes	DSL	EINECS
Selenium	7782-49-2	Yes	DSL	EINECS
Calcium fluoride (CaF <sub>2</sub> )	7789-75-5	Yes	DSL	EINECS

**\*\*\* Section 16 - Other Information \*\*\***

### Other Information

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

### Key/Legend

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

End of Sheet