

Material Safety Data Sheet

Material Name: Steelmaking Slag

*** 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

Various handling operations (crushing, grinding, sizing, conveying, etc.) may cause dust to be released. Excessive exposure to high concentrations of dust may cause irritation of the upper respiratory system

Potential Health Effects: Eyes

Dusts may cause irritation.

Potential Health Effects: Skin

May cause irritation.

Potential Health Effects: Ingestion

Not a likely route of exposure under normal use conditions. May cause gastrointestinal irritation if swallowed.

Potential Health Effects: Inhalation

Excessive exposure to high concentrations of dust may cause irritation of the mucous membranes of the upper respiratory system and may cause coughing, sneezing and inflammation of the respiratory passages. Exposure to slag dust containing small amounts of silica particles less than 5 microns in diameter may result in silicosis if inhaled in high enough concentrations over an extended period of time. The principal manifestation of silicosis is difficult breathing. This condition can progress to dry cough, shortness of breath on exertion, decreased lung function, and massive pulmonary fibrosis. High level doses may cause acute Silicosis in 1 - 3 years. Chronic Silicosis may not occur for 10 - 20 or more years after exposures begin, and sometimes long after they have ceased.

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
1305-78-8	Calcium oxide	23-30
1309-37-1	Iron oxide	1-46
14808-60-7	Quartz	7-29
1309-48-4	Magnesium oxide fume	5-21
1344-28-1	Aluminum oxide	4-17
7439-96-5	Manganese	1-10
7440-47-3	Chromium	<1
13463-67-7	Titanium dioxide	<1
1314-56-3	Phosphorus pentoxide	<1
7704-34-9	Sulfur	<0.1

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

First Aid: Eyes

Flush with water immediately for 15 minutes. Seek medical aid.

First Aid: Skin

Wash skin with soap and water. For contact with molten product, do not remove contaminated clothing. Flush area with large amounts of cold water. If possible, submerge area in cold water, pack with ice and seek medical aid.

First Aid: Ingestion

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting.

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First Aid: Inhalation

Remove from exposure to dust, administer oxygen or artificial respiration as needed.

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

General Fire Hazards

See Section 9 for Flammability Properties.

Fire and explosion hazards are not associated with this product.

Hazardous Combustion Products

Not Determined

Extinguishing Media

Use appropriate extinguishing media for surrounding fire.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear.

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

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

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

Containment Procedures

None necessary.

Clean-Up Procedures

Pick up mechanically or by hand tools. Fine material should be removed by vacuuming or wet sweeping to minimize dusting. Avoid using compressed air.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

Clean-up personnel should be protected against eye or skin contact and inhalation of dust.

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

Handling Procedures

Use good housekeeping practices to prevent accumulation of dust, and follow sound cleaning techniques that will keep airborne particulate to a minimum. Avoid inhalation of dust and excessive contact with eyes and skin.

Storage Procedures

No special storage needed.

*** 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)

Quartz (14808-60-7)

ACGIH: 0.025 mg/m3 TWA (respirable fraction)

OSHA: 0.1 mg/m3 TWA (respirable dust)

NIOSH: 0.05 mg/m3 TWA (respirable dust)

Magnesium oxide fume (1309-48-4)

ACGIH: 10 mg/m3 TWA (inhalable fraction)

OSHA: 10 mg/m3 TWA (total particulate)

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Aluminum oxide (1344-28-1)

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

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

Titanium dioxide (13463-67-7)

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

Chromium (7440-47-3)

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

Engineering Controls

Provide general ventilation or local exhaust ventilation where material is used or processed to prevent excessive dust exposure.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with sideshields for impact and to prevent dust particles from entering the eye.

Personal Protective Equipment: Skin

Wear protective gloves as required for handling operations.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved dust respirator should be used to avoid excessive inhalation of particles. Appropriate respirator selection depends on the magnitude of exposure.

Personal Protective Equipment: General

Depending upon conditions of use and specific work situations, additional protective equipment and/or clothing may be required to control exposures.

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

Appearance:	Dark gray rock-like material.	Odor:	None
Physical State:	Solid	pH:	NA
Vapor Pressure:	NA	Vapor Density:	NA
Boiling Point:	NA	Melting Point:	NA
Solubility (H2O):	NA	Specific Gravity:	80/63.4
Evaporation Rate:	NA	VOC:	NA
Octanol/H2O Coeff.:	NA	Flash Point:	NA
Flash Point Method:	NA	Upper Flammability Limit (UFL):	NA
Lower Flammability Limit (LFL):	NA	Burning Rate:	NA
Auto Ignition:	NA		

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

Chemical Stability

This is a stable material.

Chemical Stability: Conditions to Avoid

None

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Incompatibility

None

Hazardous Decomposition

None

Possibility of Hazardous Reactions

Will not occur.

* * * **Section 11 - Toxicological Information** * * *

Acute Dose Effects

A: General Product Information

Based on animal experimental studies and human health findings, overexposure to slag dust and/or some components of slag (i.e. various complexed amorphous silicates) can cause pneumoconiosis and may pose a fibrogenic potential to the lung. Individuals overexposed to slag dusts may be at an increased risk of progression of existing lung impairment.

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

Quartz (14808-60-7)

Oral LD50 Rat: 500 mg/kg

Aluminum oxide (1344-28-1)

Oral LD50 Rat: >5000 mg/kg

Manganese (7439-96-5)

Oral LD50 Rat: 9 g/kg

Phosphorus pentoxide (1314-56-3)

Inhalation LC50 Rat: 1.22 mg/L/1H

Titanium dioxide (13463-67-7)

Oral LD50 Rat: >10000 mg/kg

Sulfur (7704-34-9)

Inhalation LC50 Rat: >9.23 mg/L/4H; Oral LD50 Rat:>3000 mg/kg; Dermal LD50 Rabbit:>2000 mg/kg

Repeated Dose Effects

Repeated or prolonged contact with the skin and direct eye contact with slag dust is likely to cause irritation. Contact with molten slag can cause serious thermal burns and permanent scarring. Long-term inhalation of iron oxide dust may produce a benign pneumoconiosis (siderosis)

Carcinogenicity

A: General Product Information

IARC has determined crystalline silica to be a probable human carcinogen.

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))

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Quartz (14808-60-7)

ACGIH: A2 - Suspected Human Carcinogen
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select 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))

Magnesium oxide fume (1309-48-4)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

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))

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))

*** 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

Sulfur (7704-34-9)

Test & Species

96 Hr LC50 Brachydanio rerio

866 mg/L [static]

Conditions

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

Component Waste Numbers

Chromium (7440-47-3)

RCRA: 5.0 mg/L regulatory level

Disposal Instructions

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

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

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Not Regulated

TDG Information

Shipping Name: Not Regulated

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*** Section 15 - Regulatory Information ***

US Federal Regulations

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).

Aluminum oxide (1344-28-1)

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

Manganese (7439-96-5)

SARA 313: 1.0 % de minimis concentration

Chromium (7440-47-3)

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)

State Regulations

A: General Product Information

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

B: Component Analysis - State

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

Component	CAS	CA	MA	MN	NJ	PA	RI
Calcium oxide	1305-78-8	Yes	Yes	Yes	Yes	Yes	Yes
Iron oxide	1309-37-1	Yes	Yes	Yes	Yes	Yes	Yes
Quartz	14808-60-7	No	Yes	Yes	Yes	Yes	Yes
Magnesium oxide fume	1309-48-4	Yes	Yes	Yes	Yes	Yes	Yes
Aluminum oxide	1344-28-1	Yes	Yes	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Phosphorus pentoxide	1314-56-3	No	Yes	No	Yes	Yes	No
Titanium dioxide	13463-67-7	No	Yes	Yes	Yes	Yes	Yes
Chromium	7440-47-3	Yes	Yes	Yes	Yes	Yes	Yes
Sulfur	7704-34-9	Yes	Yes	No	Yes	Yes	Yes

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

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

Component Analysis - WHMIS IDL

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

Component	CAS #	Minimum Concentration
Calcium oxide	1305-78-8	1 %
Iron oxide	1309-37-1	1 %
Quartz	14808-60-7	1 %
Magnesium oxide fume	1309-48-4	1 %
Aluminum oxide	1344-28-1	1 %
Manganese	7439-96-5	1 %
Chromium	7440-47-3	0.1 %

Additional Regulatory Information

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Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Calcium oxide	1305-78-8	Yes	DSL	EINECS
Iron oxide	1309-37-1	Yes	DSL	EINECS
Quartz	14808-60-7	Yes	DSL	EINECS
Magnesium oxide fume	1309-48-4	Yes	DSL	EINECS
Aluminum oxide	1344-28-1	Yes	DSL	EINECS
Manganese	7439-96-5	Yes	DSL	EINECS
Phosphorus pentoxide	1314-56-3	Yes	DSL	EINECS
Titanium dioxide	13463-67-7	Yes	DSL	EINECS
Chromium	7440-47-3	Yes	DSL	EINECS
Sulfur	7704-34-9	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