SAFETY DATA SHEET

Section 1: Identification

1.1 Product identifier:

CRH Slag Cement

Other means of identification:

- GGBFS
- Ground Granulated Blast Furnace Cement

1.2 Recommended use and restrictions on use:

Identified uses:

Industrial uses in manufacture of concrete, portland cement, blended cement and other building and construction materials.

Restrictions on use:

Keep out of reach of children.

1.3 Supplier identifier:

CRH Canada Group Inc.
2300 Steeles Ave. W., 4th Floor
Concord, ON, L4K 5X6
Canada
Information Telephone Number: 905-761-7100

CRH US
15225 Day Road
Dundee MI 48131
USA
Information Telephone Number: 734-529-4651

1.4 Emergency telephone number:

In Canada: 1-613-996-6666 CANUTEC (Call Collect or *666 Cellular) 24-hours
In USA: 800-451-8346 3E COMPANY 24-hours

Section 2: Hazards Identification

2.1 Classification:

Eye Damage Cat. 1; H318
Skin irritation Cat. 2; H315
Specific Target Organ Toxicity, Single Exposure, Cat. 3; H335
Carcinogenicity (inhalation) Cat. 1; H350
Specific Target Organ Toxicity, Repeated Exposure (inhalation), Cat. 1; H372

2.2 Label elements:

Danger.
Causes serious eye damage.
Causes skin irritation.
May cause respiratory irritation.
May cause cancer if inhaled.
Causes damage to lungs through prolonged or repeated exposure if inhaled.

Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dusts.
Wash hands and exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective eye protection, face protection, protective gloves, protective clothing.

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
If skin irritation occurs: Get medical attention.
Take off contaminated clothing and wash it before reuse.

SAFETY DATA SHEET

Section 2: Hazards Identification

2.2 Label elements: (continued)

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF exposed or concerned: Get medical attention.

Storage

Store locked up.

Disposal

Recycle and or dispose of contents and containers in accordance with local, regional, national and international regulations.

2.3 Other hazards:

The potential exists for static build-up and static discharge when moving Slag cement powders through a plastic, nonconductive or non-grounded pneumatic conveyance system. Static discharge may result in damage to equipment and injury to workers.

Section 3: Composition/Information on Ingredients

Chemical Name	Common name / Other identifiers	CAS No.	Wt.%	GHS Classification
Slags, ferrous metal, blast furnace	Blast furnace slag	65996-69-2	>95	Skin Irrit. 2; H315 Eye Dam. 1; H318 STOT SE 3: H335
Crystalline silica, Quartz	Silicon dioxide	14808-60-7	0.1 – 1.5	Carc. 1; H350 STOT RE1; H372

Other composition information :

The majority of components in Granulated Blast Furnace Slag are various glassy Metallic Silicates (Iron, Calcium, Magnesium, Aluminum, and Titanium Silicates), including: Dicalcium Silicate (Ca_2SiO_4) 14284-23-2, Merwinite ($Ca_3MgSi_2O_8$) 13813-64-4, and Gehlenite ($Ca_2Al_2SiO_7$) 1302-56-3.

Granulated blast-furnace slag is a co-product of the steel industry produced by adding a limestone flux to the ore to remove non-ferrous contaminants. As such, it may contain small quantities of hazardous heavy metals, including trace amounts of chromium, usually in solution in the glass.

Ground granulated blast-furnace slag (GGBFS) is a vitreous material containing silica, alumina, magnesia and calcium oxides. It also contains a small quantity of iron, sodium, titanium and manganese oxides. The oxides do not actually occur in free form but as complexed silica-based glasses.

Section 4: First-Aid Measures

4.1 Description of first aid measures:

Precautions: First aid providers should avoid direct contact with this chemical. Wear chemical protective gloves, if necessary. Take precautions to ensure your own safety before attempting rescue, (e.g. wear appropriate protective equipment).

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If exposed or concerned: Call a POISON CENTER or doctor.

Eye Contact: Immediately rinse eyes cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or Doctor. Take care not to rinse contaminated water into the unaffected eye or onto face.

Skin Contact: Take off immediately all contaminated clothing, shoes/boots and leather goods such as watchbands and belts. Rinse skin with water or shower.
GImmediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH neutral soap. Seek medical attention for rashes, burns, irritation or dermatitis.. Wash contaminated clothing before reuse.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention immediately or transport victim to an emergency treatment center.

SAFETY DATA SHEET

4.2 Most important symptoms and effects, both acute and delayed:

Inhalation: High concentrations of airborne dusts are irritating to the upper respiratory tract with symptoms such as coughing, sneezing and shortness of breath. Long-term inhalation exposure to dusts containing respirable size crystalline silica can cause silicosis and lung cancer.

Eye Contact: Severely irritating in contact with eyes. Causes eye damage which may be permanent and may cause blindness. Solid particles react with moisture in the eye to form clumps of moist compound which may be difficult to remove. Sharp, glassy particles can cause damage to eye tissue by mechanical abrasion.

Skin Contact: Dusts from this product, when combined with water or sweat, produce an irritating alkaline solution and possible burning of the skin. Symptoms include pain, skin dryness, cracking, eczema and possible caustic burns. Sharp, glassy particles can cause damage to the skin.

Ingestion: Severely irritating to the mouth, throat and gastro-intestinal system if swallowed. Symptoms may include severe pain and burning of the mouth, throat, esophagus and gastrointestinal tract with nausea, vomiting and diarrhea. If aspiration into the lungs occurs during vomiting, severe lung damage may result.

4.3 Immediate medical attention and special treatment needed:

Get immediate medical attention if in eyes.
Employees who work with wet cementitious materials and experience skin problems, including seemingly minor ones, are advised to see a health care professional for evaluation and treatment. In cement-related dermatitis, early diagnosis and treatment can help prevent chronic skin problems.

Section 5: Fire-fighting Measures

5.1 Extinguishing media:

Use extinguishing media appropriate to the surrounding fire conditions. Use flooding quantities of water as a spray.

Unsuitable extinguishing media: Use caution when using water. Do not get water inside closed containers; contact with water will generate heat. Water jet may cause spattering of the alkaline solution. Use caution when using CO_2; it may scatter the dry powder.

5.2 Specific hazards arising from the product:

Product is not flammable or combustible.
Bulk powder of this product may heat spontaneously when damp with water.
Reacts with water releasing heat and forming an alkaline solution.

5.3 Special protective equipment and precautions for firefighters:

As for any fire, evacuate the area and fight the fire from a safe distance. Firefighters must wear full protective equipment including self-contained breathing apparatus with chemical protection clothing when firefighters are exposed to decomposition products from this material.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Wear adequate personal protective equipment, including an appropriate respirator as indicated in Section 8. Isolate spill area, preventing entry by unauthorized persons. Do not touch spilled material. Do not breathe dusts.

6.2 Environmental precautions:

Avoid releases to the environment and prevent material from entering sewers, natural waterways or storm water management systems.

6.3 Methods and material for containment and cleaning up:

Move containers from spill area. Avoid dust generation and prevent wind dispersal. Do not dry sweep or blow with compressed air. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labelled waste container. Small spills may be picked up with a damp mop.

6.4 Additional Information:

See Section 8 for information on selection of personal protective equipment.
See Section 13 for information on disposal of spilled product and contaminated absorbents.

SAFETY DATA SHEET

Section 7: Handling and Storage

7.1 Precautions for safe handling:

Before handling, it is important that engineering controls are operating, protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dusts.
Wash hands and exposed skin thoroughly after handling. Wash with plenty of water and pH neutral soap; do not use waterless hand cleaners such as alcohol-based gels. Clean nail beds and creases between fingers. Dry hands thoroughly with a clean towel before putting on gloves.
Avoid wearing watches and rings at work; wet particulate can collect next to the skin and cause burns.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Prevent eye contact: Wear protective gloves, protective clothing and eye protection or face protection.
Follow good practices for safe glove removal.

Static Hazard: Properly ground all pneumatic conveyance systems. Static discharge may result in damage to equipment and injury to workers.

7.2 Conditions for safe storage:

Store in a dry, well-ventilated area, away from incompatible materials. Keep containers closed.
Protect from moisture/humidity.
Store in a place accessible by authorized persons only.
Store away from food and animal feed.
Keep out of reach of children.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters:

Occupational Exposure Limits: Consult local authorities for acceptable exposure limits.

Ingredient	ACGIH® TLV®	U.S. OSHA PEL	Ontario (Canada) TWA
Slags, ferrous metal, blast furnace	Not established	Not established	Not established
Crystalline silica (Quartz)	0.025 mg/m^3 (respirable)	quartz (total dust): 30 mg/m^3 / (%Si02 + 2) quartz (respirable): 10 mg/m^3 / (%Si02 + 2)	0.1 mg/m^3 (respirable) Designated Substance
Particles, not otherwise specified	10 mg/m^3 (total dust) 3 mg/m^3 (respirable)	15 mg/m^3 (total dust) 5 mg/m^3 (respirable)	Refer to ACGIH TVL

8.2 Exposure controls:

Engineering Controls: Handle product in closed system or area provided with appropriate exhaust ventilation. Handle in accordance with good industrial hygiene and safety practice. Ensure regular cleaning of equipment, work area and clothing.

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have equipment available for use in emergencies such as spills or fire.

SAFETY DATA SHEET

8.3 Individual Protection Measures:

Eye/Face Protection: Wear approved safety glasses with side-shields or chemical safety goggles. Wear a face-shield or full-face respirator when needed to prevent exposure to airborne dusts. Contact lenses should not be worn.

Skin Protection: Wear waterproof, snug-fitting alkali-resistant gloves, boots, knee and elbow pads to prevent skin exposure. Wear protective clothing with long-sleeves and long pants. Protective clothing can be taped inside gloves and boots. Evaluate resistance under conditions of use and maintain protective clothing carefully. Contact safety supplier for specifications.

Respiratory Protection: Approved respiratory protective equipment (RPE) is required. An approved respirator, N95 rating or higher, must be available in case of accidental releases. Consult with respirator manufacturer to determine respirator selection, use and limitations.

A respiratory protection program that meets the regulatory requirement, such as OSHA's 29 CFR 1910.134, ANSI Z88.2 or Canadian Standards Association (CSA) Standard Z94.4, must be followed whenever workplace conditions warrant a respirator's use.

Other Protection: Have adequate washing facilities and eyewash fountain readily available in the work area for immediate emergency use.

Every attempt should be made to avoid skin and eye contact with Slag cement. Do not get powder inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with Slag cement mixtures. Wash clothing and shoes thoroughly before reuse.

Do not eat, drink or smoke where this material is handled, stored and processed. Wash hands thoroughly before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas.

Environmental Exposure Controls: Emissions from ventilation or work process equipment should be monitored to ensure they comply with the requirements of environmental protection legislation.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:	
Appearance:	Solid; grey granules or powder
Odour:	Odourless
Odour threshold:	Not applicable
pH:	>8 - 10
Melting point/freezing point:	Not applicable
Initial boiling point and boiling range:	Not applicable
Flash point:	Not applicable
Evaporation rate:	Not applicable
Flammability:	Not flammable or combustible
Upper/lower flammability or explosive limits:	Not applicable
Vapour pressure:	Not applicable
Vapour density:	Not applicable
Relative density:	3.1 – 3.2 (water = 1)
Solubility (ies):	Slightly soluble in water (0.1 – 1%)
Partition coefficient (n-octanol/water):	Not applicable
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available
Viscosity:	Not applicable

SAFETY DATA SHEET

Section 10: Stability and Reactivity

10.1 Reactivity:

Reacts slowly with water forming hydrated compounds, releasing heat and a alkaline solution.

10.2 Chemical Stability:

Stable at normal ambient and anticipated storage and handling conditions.

10.3 Possibility of Hazardous Reactions:

Aqueous solutions are alkaline and may corrode aluminum.

10.4 Conditions to Avoid:

Avoid unintentional contact with water / moisture and with strong acids and other incompatible materials.

10.5 Incompatible Materials:

Strong acids - Incompatible with strong acids; may react vigorously.
Water - reaction generates heat.
Aluminum – Aluminum powder and other alkali earth elements will react in the presence of water liberating extremely flammable hydrogen gas. Calcium oxide is corrosive to aluminum metal.
Fluoride compounds – cement dissolves in HF producing corrosive silicon tetrafluoride gas.
Reacts with Ammonium salts.

10.6 Hazardous Decomposition Products:

In contact with water and moisture, generates corrosive calcium hydroxide.

Section 11: Toxicological Information

11.1 Likely routes of exposure:

Eye and Skin contact, Inhalation of dust.

11.2 Acute toxicity data:

Data not available for the mixture.

Skin corrosion / irritation:

Human experience has shown Slag cement can cause skin irritation.
Irritating or corrosive to mouth, throat and gastro-intestinal tract.

Serious eye damage / irritation:

Based on information for Slag cement: Causes serious eye damage and possible blindness. Damage may be permanent if treatment is not immediate.

STOT (Specific Target Organ Toxicity) Single Exposure:

Breathing dusts causes respiratory irritation. Inflammation of the respiratory passages, ulceration and perforation of the nasal septum and pneumonia has been attributed to the inhalation of dust containing Slag cement.

Aspiration hazard:

Data not available. This material is alkaline; if aspiration into the lungs occurs during vomiting, severe lung damage may result.

SAFETY DATA SHEET

11.3 Chronic toxicity:

STOT (Specific Target Organ Toxicity) Repeated Exposure:

Prolonged and repeated breathing of dust may cause lung disease. The extent and severity of lung injury correlates with the length of exposure and dust concentration. Inflammation of the respiratory passages, ulceration and perforation of the nasal septum and pneumonia has been attributed to the inhalation of dust containing Slag cement.

Contains crystalline silica. Long-term exposure to fine airborne crystalline silica dust may cause silicosis a form of pulmonary fibrosis that can cause shortness of breath, cough and reduced lung function. Particles with diameters less than 1 micrometer are considered most hazardous.

Respiratory and / or skin sensitization:

Product may contain trace concentrations (<0.1%) of Chromate compounds that can cause an allergic skin reaction, allergic contact dermatitis, or ACD. Once sensitized, brief skin contact with very small amounts of Cr VI may result in inflammation, rash, itching or severe skin ulcers.
Not known to be a respiratory sensitizer.

Germ cell mutagenicity:

Data not available.

Reproductive effects:

Data not available.

Developmental effects:

Data not available.

Effects on or via lactation:

Data not available.

Carcinogenicity:

Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity.

Interactions with other chemicals:

Not available

Section 12: Ecological Information

12.1 Toxicity:

Data not available.

Contact with water forms an alkaline solution. Avoid release to the environment.

12.2 Persistence and degradability:

Not readily biodegradable

12.3 Bioaccumulative potential:

Not available

12.4 Mobility in soil:

Not available

Section 13: Disposal Considerations

13.1 Disposal methods:

Dispose as an inert, non-metallic mineral in accordance with applicable federal, state/provincial and local regulations. Avoid generating dust during disposal. Avoid contact with skin and eyes. See Section 8 for personal protection measures. Prevent material from entering sewers, drains, ditches or waterways.

SAFETY DATA SHEET

Section 14: Transport Information

14.1 UN Number
Not regulated

14.2 UN proper shipping name
Not applicable

14.3 Transport hazard class(es)
Not applicable

14.4 Packing group
Not applicable

14.5 Environmental hazards
Not available

14.6 Special precautions for user
Not available

14.7 U.S. Hazardous Materials Regulation (DOT 49CFR):
Not regulated except for transport by aircraft.

14.8 Canada Transportation of Dangerous Goods (TDG) Regulations:
Not regulated except for transport by aircraft.

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

TSCA Status:
Substances are listed on the TSCA inventory or are exempt.

Canada

NSNR Status:
Substances are listed on the on the DSL or are exempt.

International Inventories:

Australia: Slags, ferrous metal, blast furnace listed on the Inventory of Chemical Substances (AICS).

China: Not available

European Union: Slags, ferrous metal, blast furnace EC # 266-043-4.

Japan: Not available.

Korea: Not available

Mexico: Not available

New Zealand: Slags, ferrous metal, blast furnace listed on the Inventory.

Philippines: Not available

Taiwan: Slags, ferrous metal, blast furnace listed on the Inventory (TCSI).

Turkey: Slags, ferrous metal, blast furnace EC # 266-043-4.

SAFETY DATA SHEET

Section 16: Other Information

Revision date:

April 6, 2016

References and sources for data:

CCOHS, Cheminfo
RTECS, Registry of Toxic Effects of Chemical Substances
NIOSH, Pocket Guide to Chemical Hazards.
Portland Cement Association

Methods for classification of mixtures:

USA: Haz Com Standard 29 CFR 1910.1200 (2012)
Canada: Controlled Products Regulations.
UNECE, Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

Legend to abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists
GHS- Globally Harmonized System for Classification and Labeling.
OEL– Occupational exposure limit
OSHA - Occupational Safety and Health Administration
TWA – Time weighted average
TLV - Threshold Limit Value
WHMIS – Canada Workplace Hazardous Materials Information System.

Additional information:

While the information provided in this document is believed to provide a useful summary of the hazards of Slag cement, the information in this document cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product. The data furnished in this document do not address hazards that may be posed by other materials when mixed with Slag cement. Users should review other relevant safety data sheets before working with this product. The information presented in the Safety Data Sheet is based on current knowledge and publications and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not be interpreted as guaranteeing any specific property of the product.

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