

## MATERIAL SAFETY DATA SHEET

### SECTION 1- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Names: St. Marys CemPlus, Slag Granules, Slag Cement, Ground Granulated Blast Furnace Slag (GGBFS), Granulated Blast Furnace Slag (GBFS)

#### WHMIS classification D2A, E

Chemical Name and Synonyms: Slags, Ferrous Metal, Blast Furnace  
 Chemical Family: *Calcium Compounds, Amorphous Silicates*  
 Manufacturer: St. Marys Cement  
 55 Industrial Street  
 Toronto, ON M4G 3W9

Informational Telephone Number: 1-800-268-6148 (Canada)  
 1-800-462-9157 (Ext.537) (U.S.)  
 Emergency Telephone Number: 1-613-996-6666 CANUTEC (Call Collect or \*666 Cellular) (Canada)  
 1-800-462-9157 (U.S.)

General Information Blast furnace slag is a by-product of the steel industry produced by adding a limestone flux to the iron-ore to remove non-ferrous contaminants. Granulated Blast Furnace Slag is obtained by rapid cooling or quenching of molten slag and is tan in colour and has a fine sand consistency. Ground Granulated Blast Furnace Slag is typically ground to the fineness of Portland cement and is a constituent in combination with Portland cement in concrete mixtures and is white to grey in colour and has a powder consistency.

### SECTION 2 – COMPOSITION/INFORMATION ON INGREDIENTS

Major ingredients: Glassy (Amorphous) calcium silicate, calcium aluminosilicates

Component	CAS #	Percent (By Weight)	OSHA-PEL, TWA (mg/m <sup>3</sup> )	ACGIH-TLV, TWA (mg/m <sup>3</sup> )
Granulated Slag	65996-69-2	100	15 (T); 5 (R)	10 (T); 3 (R)
Crystalline Silica	14808-60-7	0.1	(10 ÷ [%SiO <sub>2</sub> + 2])*	0.025 (R)

(T) = Total Dust; (R) = Respirable Fraction

\* 29CFR 1910.1000 Table Z-3 Mineral Dusts

#### Trace Elements

Blast furnace slag may contain small quantities of hazardous heavy metals, usually in the glassy silicate phase.

## **SECTION 3 - HAZARDS IDENTIFICATION**

### **Emergency Overview**

Blast furnace slags pose little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns, including third degree burns. Blast furnace slag granules or granulated slag may contain 'glassy wool' or microscopic sharp glassy material, resulting from the rapid quenching of molten slag. Skin and eye protection should be worn to protect against exposure and mechanical abrasion.

### Engulfment hazard

Ground granulated blast furnace slags can build up or adhere to the walls of a confined space such as a silo, bin, bulk truck, or other container or vessel. The material can be detached, collapse or fall unexpectedly. To prevent burial or suffocation, do NOT enter a confined space without precautions appropriate to Confined Spaces.

Relevant routes of exposure: Eye contact, skin contact, inhalation, and ingestion.

### Effects Resulting from Eye Contact:

Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by larger amounts of dry powder or splashes of wet material may cause effects ranging from moderate eye irritation to chemical burns and blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

### Effects Resulting from Skin Contact:

Discomfort or pain cannot be relied upon to alert a person to a hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and injury has occurred.

Exposure to dry material may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Skin contact under wet or dry conditions may cause more severe skin effects including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (caustic) chemical burns.

Some ultra-sensitive individuals may exhibit an allergic response upon exposure to CemPlus, possibly due to trace amounts of chromium (hexavalent chromium salts). The response may appear in a variety of forms ranging from mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product; other persons may first experience this effect only after years of contact.

### Effects Resulting from Inhalation:

Blast furnace slags may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free crystalline silica may aggravate other lung conditions. It also may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases.

Exposure to dusts may cause irritation to the moist membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

**Effects Resulting from Ingestion:**

Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are accidentally consumed.

**Carcinogenic Potential:** See Section 11.

**SECTION 4 - FIRST AID****Eyes:**

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Seek Medical Attention.

**Skin:**

Wash skin with cool water and mild soap or detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure.

**Inhalation:**

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. Seek medical attention if gross amounts of dust are inhaled.

**Ingestion:**

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

**SECTION 5 - FIRE & EXPLOSION DATA**

Flash Point .....None

Lower Explosive Limit .....None

Upper Explosive Limit.....None

Auto Ignition Temperature .....Not Combustible

Extinguishing Media.....Not Combustible

Special Fire Fighting Procedures .....None

*Although slag products pose no fire-related hazards, a self-contained breathing apparatus is recommended to limit exposure to combustion products when fighting any fire.*

Hazardous Combustion Products.....None

Unusual Fire and Explosion Hazards.....None

**SECTION 6 - ACCIDENTAL RELEASE MEASURES**

Collect dry material in an appropriate container and minimize dust. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in an appropriate container. Allow the material to dry before disposal. Do not wash solids down drains.

Dispose of waste material according to local, state, provincial and federal regulations (see Section 13).

## SECTION 7 - HANDLING AND STORAGE

Keep products dry until used. Normal temperatures do not affect the material. Promptly remove dusty or wet clothing and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

Static Hazard: Properly ground all pneumatic conveyance systems. The potential exists for static build-up and discharge when moving 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 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

### Skin Protection:

Prevention is essential in avoiding potentially severe skin injury. Avoid contact. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure might occur, wear impervious clothing and gloves. Where required, wear boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely solely on barrier creams; barrier creams should not be used in place of gloves.

Periodically wash affected areas with a mild soap. If irritation persists, immediately wash the affected area and seek treatment. Clothing saturated with wet concrete, should be removed and replaced with clean dry clothing.

### Respiratory Protection:

Avoid actions that cause dust to become airborne. Use NIOSH-approved (N95 rating or greater) respirators if an exposure limit is exceeded, or when dust causes discomfort or irritation.

### Ventilation:

Use local exhaust, where practicable, or general dilution ventilation to control exposure within applicable limits.

### Eye protection:

Wear ANSI- or CSA-approved safety glasses with side shields or goggles. Provide emergency eyewash stations. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with slag products.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance .....	Grey or white powder
Odour .....	No distinct odour
Physical State .....	Solid
pH in Water (ASTM D 1293-95).....	8 to 11
Solubility in Water.....	Slightly Soluble (0.1 to 1.0%)
Vapour Pressure .....	Not Applicable

Vapour Density .....	Not Applicable
Boiling Point .....	Not Applicable (i.e. > 1000°C)
Melting Point .....	Not Applicable
Specific Gravity (H <sub>2</sub> O = 1.0) .....	2.92
Evaporation Rate.....	Not Applicable

## **SECTION 10 - STABILITY AND REACTIVITY**

Stability: Stable.

Conditions to Avoid: Unintentional contact with water.

Incompatibility: Slag products are alkaline and are incompatible with acids and aluminum metal.

Hazardous Decomposition Products: Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.

Hazardous Polymerization: Will not occur.

## **SECTION 11 - TOXICOLOGICAL INFORMATION**

### Acute Toxicity

Blast furnace slags and their components – glassy calcium silicates and silica – are not acutely toxic.

### Chronic Toxicity:

Blast furnace slags are not specifically listed as carcinogens by the National Toxicology Program (NTP), the Occupational Safety and Health Administration (OSHA), or the International Agency for Research on Cancer (IARC); they may, however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a potential trace level contaminant, is designated as carcinogenic to humans (Group 1, IARC); ACGIH Group 2A “suspected human carcinogen” (limited evidence of carcinogenicity in humans and sufficient evidence in experimental animals with relevance to humans; NTP indicates that crystalline silica is reasonably anticipated to be a carcinogen (Group 2).

Respirable crystalline silica is also the chief cause of pulmonary dust disease. Prolonged inhalation of crystalline silica can result in silicosis, a disabling pulmonary fibrosis characterized by generalized fibrotic changes, the development of miliary nodules in both lungs, and clinically by shortness of breath on exertion, decreased chest expansion, lessened capacity for work, dry cough, absence of fever, increased susceptibility to tuberculosis, and characteristic x-ray findings of diffuse discrete nodulation scattered throughout both lung fields. In advanced stages, silicosis can include marked fatigue, extreme dyspnea and cyanosis, loss of appetite, pleuritic pain and total incapacity to work. The disease can result in death either from cardiac failure or from destruction of lung tissue, with resultant anoxemia.

### Chromates and Nickel Compounds

Cement products may contain trace amounts of hexavalent chromium and nickel compounds. Soluble chromates in cement have been stated to be the cause of cement dermatitis in some workers. Inorganic nickel compounds – pure or in trace amounts – are not absorbed through the skin in amounts sufficient

to cause systemic intoxication. However, their capability to cause contact dermatitis in sensitized individuals is well known.

## **SECTION 12 - ECOLOGICAL INFORMATION**

Ecotoxicity: No recognized unusual toxicity to plants or animals.

## **SECTION 13 - DISPOSAL**

Dispose of, or recycle, material and containers according to local, state, provincial and federal regulations. Material may generally be disposed to landfill after confirmation of suitability through leachate testing. Since blast furnace slags are stable, uncontaminated material may be saved for future use. Dispose of bags in an approved landfill or incinerator.

## **SECTION 14 - TRANSPORTATION DATA**

Hazardous Material Description/Proper Shipping Name:

Blast furnace slags are not hazardous under U.S. Department of Transportation (DOT) or Canadian Transportation of Dangerous Goods (TDG) regulations.

Hazard Class: Not applicable.

Identification Number: Not applicable.

Required Label Text: Not applicable.

Hazardous Substances/Reportable Quantities: Not applicable.

## **SECTION 15 - OTHER REGULATORY INFORMATION**

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200:

Blast furnace slag is considered a hazardous chemical under this regulation and should be part of any hazard communication program.

Status under CERCLA/Superfund, 40 CFR 117 and 302: Not listed.

Hazard Category under SARA (Title III), Sections 311 and 312:

Slags qualify as hazardous substance with delayed health effects.

Status under SARA (Title III), Section 313:

Not subject to reporting requirements under Section 313.

Status under TSCA (as of May 1997):

Some substances in blast furnace slag are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act:

Blast furnace slag is a hazardous substance subject to statutes promulgated under the subject act.

Status under California Proposition 65:

This product contains chemicals (trace metals) known to the State of California to cause cancer, birth defects, or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

Status under the Canadian Environmental Protection Act: Not listed.

Status under the Canadian Workplace Hazardous Materials Information System (WHMIS):

Blast furnace slag is considered to be a hazardous material under the *Hazardous Products Act* as defined by the *Controlled Products Regulations* (CPR) These products have been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

## **SECTION 16 - OTHER INFORMATION**

Revision Date: September 2010      Prepared by: IHEAS Inc. (Tel. 519-657-5105)  
Date of Previous MSDS: September 2007

Products should only be used by knowledgeable, trained persons.

The information provided in this material safety data sheet is believed to provide a useful summary of the hazards of blast furnace slag as it is commonly used; this sheet cannot anticipate and provide all of the information that might be needed in every situation.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with slag products.

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