

MATERIAL SAFETY DATA SHEET

Section 1 - IDENTIFICATION

Product Name: Portland-Slag Blended Cements

CAS Reg. No.: Not assigned for mixture.

Chemical Name and Synonyms: Portland-Slag Blended Cement

Trade Names: Portland-Slag Blended Cement Types: I S, I SM

MSDS Information: This MSDS supersedes prior MSDS's for the products noted above. This MSDS covers a number of products with similar applications and occupational exposure hazards. Specific constituents and methods of preparation for these products will vary. The term "Portland-Slag Cement", used in the text of this MSDS, refers to the above named products collectively.

Chemical Family: Calcium silicate compounds; calcium compounds containing iron and aluminum; blast furnace slag; and gypsum are the primary constituents of these products.

Informational Phone Numbers:
 (800) 437-7762 Customer Service - Nazareth, PA
 (800) 336-0366 Customer Service - Speed, IN
 (800) 624-8986 Customer Service - Martinsburg, WV
 (800) 386-2111 Customer Service - Mississauga, ONT

Emergency Contact Information: (800)-424-9300 Chemtrec

MSDS Prepared by: Essroc MSDS Development Committee - (610) 837-6725 – May 18, 2010

Section 2 - COMPONENTS

Hazardous Ingredients:

| Component | CAS No. | OSHA PEL (8-hour TWA) | ACGIH TLV | Other Information |
|-----------------------------------|------------|--|---------------------------------------|--|
| Portland Cement ⁽¹⁾ | 65997-15-1 | 15 mg total dust/m ³ 5 mg respirable dust/m ³ | 1.0 mg/m ³ respirable | IDLH: 5000 mg/m ³ LD ₅₀ : No Data |
| Gypsum | 13397-24-5 | 15 mg total dust/m ³ 5 mg respirable dust/m ³ | 10 mg/m ³ | IDLH: No Data LD ₅₀ : No Data |
| Blast Furnace Slag ⁽²⁾ | 65996-69-2 | N/A | N/A | N/A |
| Crystalline Silica (0-0.3%) | 14808-60-7 | For mineral dusts containing crystalline silica: (10 mg respirable dust/m ³)/(%SiO ₂ +2) (30 mg total dust/m ³)/(%SiO ₂ + 2) | 0.025 mg/m ³ respirable | IDLH: 50 mg/m ³ (twa) LD ₅₀ : ipr rat LD Lo 400 mg/kg |
| Titanium Oxide (<0.4% from slag) | 13463-67-7 | 10 mg total dust/m ³ 5 mg respirable dust/m ³ | 10 mg/m ³ | IDLH: No Data LD ₅₀ : No Data |

Notes:

⁽¹⁾ Portland Cement is made from materials mined from the earth and processed using energy provided by fuels. Trace amounts of naturally occurring, potentially harmful chemicals might be detected during chemical analysis. Trace constituents may include calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, and nickel compounds.

⁽²⁾ Blast Furnace Slag is a non-metallic by product of iron making consisting of greater than 95% non-crystalline silicate complexes with oxides of aluminum, calcium, magnesium, and titanium.

Section 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Portland-Slag Cement is a powder that poses little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet Portland-Slag Cement can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns, including third degree burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry Portland-Slag Cement.

POTENTIAL HEALTH EFFECTS

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 Portland-Slag Cement 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 hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet Portland-Slag Cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Exposure to dry Portland-Slag Cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Dry Portland-Slag Cement contacting wet skin or exposure to moist or wet Portland-Slag Cement 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 individuals may exhibit an allergic response upon exposure to Portland-Slag Cement, possibly due to trace amounts of chromium. The response may appear in a variety of forms ranging from a 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 after years of contact with Portland-Slag Cement products.

Effects resulting from inhalation: Portland-Slag Cement may contain free crystalline silica. Prolonged exposure to airborne free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases. (also see "Carcinogenic potential" below.)

Inhalation may also aggravate other lung conditions. Exposure to Portland-Slag Cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects resulting from ingestion: Although ingestion of small quantities of Portland-Slag Cement is not known to be harmful, ill effects are possible especially if larger quantities are consumed. Portland-Slag Cement should not be eaten.

Carcinogenic potential: Portland-Slag Cement is not listed as a carcinogen by the National Toxicology Program (NTP), International Agency for Research (IARC) or the Occupational Safety and Health Administration (OSHA). However, Portland Cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Portland-Slag Cement may contain titanium oxide (less than 0.4%). Free titanium oxide is classified by IARC as having limited evidence of carcinogenicity in animals. The ACGIH classifies titanium oxide as A4, *Not Classifiable as a Human Carcinogen*.

Medical conditions which may be aggravated by inhalation or dermal exposure:

Pre-existing upper respiratory and lung diseases.

Unusual (hyper) sensitivity to hexavalent chromium (chromium⁺⁶) salts.

Section 4 - FIRST AID

Eyes: Immediate flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes including under lids, to remove all particles. Call physician immediately.

Skin: Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of Airborne Dust: Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. ("Inhalation" of gross amounts of Portland-Slag Cement requires immediate medical attention.)

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

Section 5 - FIRE AND EXPLOSION DATA

Portland-Slag Cement is not combustible.

| | | | |
|-----------------------------------|--|-------------------------------------|----------------|
| Flash Point: | Not applicable | Upper Explosive Limit: | Not applicable |
| Auto ignition temperature: | Not applicable | Lower Explosive Limit: | Not applicable |
| Auto ignition temperature: | Not applicable | Extinguishing media: | Not applicable |
| Hazardous combustion products: | Not applicable | Unusual fire and explosion hazards: | None |
| Special fire fighting procedures: | Portland-Slag Cement poses no fire-related hazards. Self-contained breathing apparatus is recommended to limit exposure to combustion products when fighting any fire. | | |

Section 6 - ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash Portland-Slag Cement down drains.

Dispose of waste material according to local, state, and federal regulations.

Section 7 - HANDLING AND STORAGE

Keep Portland-Slag Cement dry until used. Normal temperatures and pressures do not affect the material. Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Skin protection: Prevention is essential to avoid potentially severe skin injury. Avoid contact with unhardened (wet) Portland-Slag Cement products. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened Portland-Slag Cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Where required, wear boots that are impervious to water to eliminate foot and ankle exposure.

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

Periodically wash areas contacted by dry Portland-Slag Cement or by wet cement or fluids with a pH neutral soap. Wash again at the end of the work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet cement, it should be removed and replaced with clean dry clothing.

Respiratory protection: Avoid actions that cause dust to become airborne. Use local or general ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA-approved (under 30 CFR 11) or NIOSH-approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation.

Ventilation: Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye protection: When engaged in activities where cement dust or wet cement could contact the eye, wear safety glasses with side shields or goggles. 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 Portland-Slag Cement or fresh cement products.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|----------------------|--------------------------------|---|---------------------------|
| Appearance: | Grey, white powder | Odor: | No distinct odor |
| Physical state: | Solid (powder) | pH (in water): | 12 to 13 |
| Solubility in water: | Slightly soluble (0.1 to 1.0%) | Vapor pressure: | Not applicable |
| Vapor density: | Not applicable | Boiling point: | Not applicable (>1000° C) |
| Melting point: | Not applicable | Specific gravity (H ₂ O=1.0): | 2.80 - 3.00 |
| Evaporation Rate: | Not applicable | Coefficient of oil to water distribution: | Not applicable |

Section 10 - STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: Unintentional contact with water.

Incompatibility: Wet Portland-Slag Cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

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

Hazardous polymerization: Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

| | |
|---|-----------------------|
| Route of Entry..... | Section 3 |
| Effects of acute exposure to product..... | Section 3 |
| Effects of chronic exposure to product..... | Section 3 |
| Exposure Limits..... | Section 2 |
| Irritancy of product..... | Section 3 |
| Sensitization to product | Section 3 |
| Carcinogenicity..... | Section 3 |
| Reproductive Toxicity..... | Not Applicable |
| Teratogenicity..... | Not Applicable |
| Mutagenicity..... | Not Applicable |
| Toxicologically synergistic products..... | Section 3, Section 16 |

For a description of available, more detailed toxicological information, call one of the informational phone numbers listed at the end of Section 1.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity: No recognized unusual toxicity to plants or animals.

Relevant physical and chemical properties: See sections 9 and 10.

Section 13 - DISPOSAL

Dispose of waste material according to local, state, and federal regulations. (Since Portland-Slag Cement is stable, uncontaminated material may be saved for future use.)

Dispose of bags in an approved landfill or incinerator.

Section 14 - TRANSPORTATION DATA

Hazardous materials description/proper shipping name: Portland-Slag Cement is not hazardous under U.S. Department of Transportation (DOT) regulations.

Hazard class: Not applicable.

Identification number: Not applicable

Required label text: Not applicable.

Hazardous substances/reportable quantities (RQ): Not applicable

Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA & MSHA Hazard Communication Standards (29CFR 1910.1200 & 30CFR Part 47): Portland-Slag Cement is considered a "hazardous chemical" under these regulations, 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- 312: Portland-Slag Cement qualifies as a "hazardous substance" with delayed health effects.

Status under SARA Title III, Section 313: This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 in concentrations above de minimis levels.

Toxic Substance Control Act (TSCA): Some substances in Portland-Slag Cement are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act: Portland-Slag Cement is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under Canadian Environmental Protection Act: Not listed.

Status under WHMIS: Portland-Slag Cement is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class D2A – Materials causing other toxic effects and Class E - Corrosive material) and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

SECTION 16 - OTHER INFORMATION

Abbreviations:

| | |
|----------------|---|
| ACGIH | American Conference of Government Industrial Hygienists |
| ASTM | American Society of Testing Materials |
| CAS | Chemical Abstract Service |
| CFR | Code of Federal Regulations |
| DOT | Department of Transportation |
| IARC | International Agency for Research |
| IDLH | Immediately dangerous to life and health (NIOSH). |
| m ³ | cubic meter |
| mg | Milligram |
| mm | millimeter |
| MSDS | Material Safety Data Sheet |
| MSHA | Mine Safety and Health Administration |
| NIOSH | National Institute for Occupational Safety and Health |
| NTP | National Toxicity Program |
| OSHA | Occupational Safety and Health Administration |
| PEL | Permissible Exposure Limit |
| RQ | Reportable Quantities |
| SARA | Superfund Amendments and Reauthorization Act |
| TLV | Threshold Limit Value |
| TWA | Time Weighted Average |
| URT | Upper Respiratory Tract |
| WHMIS | Workplace Hazardous Material Information System |

Other important information:

Portland-Slag Cement should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that Portland-Slag Cement chemically reacts with water, and that some of the intermediate products of this reaction (that is, those present while Portland-Slag Cement is "setting") pose a far more severe hazard than does Portland-Slag Cement itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of Portland-Slag Cement as it is commonly used, the sheet 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.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with Portland-Slag Cement to produce Portland-Slag Cement products. Users should review other relevant material safety data sheets before working with this Portland-Slag Cement or working on Portland-Slag Cement products, for example, Portland-Slag Cement concrete.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY ESSROC CEMENT CORP., except that the product shall conform to contracted specifications. The information provided herein was believed by Essroc Cement Corp. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach or warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.