Material Safety Data Sheet

Identify: Concrete unit products including concrete pavers, precast concrete slabs, standard concrete block and Architectural concrete block, concrete stones and bricks.

SECTION I

Manufacturer's Name: **Permacon Group**
Address: **8145 Bombardier St. Anjou Quebec H1J 1A5**
Date Prepared: 05-05-13 **Emergency Telephone Number: 514-351-2125**

SECTION II – HAZARDOUS INGREDIENTS/INDENTIFY INFORMATION

Concrete products are mixtures of fine and coarse aggregates, cement and water. Finished products should produce no significant hazards from normal breakage. Operations that generate airborne dusts from concrete paving products may produce hazards from chemical substances present in the original ingredients.

Hazardous Components: Silica, Crystalline Quartz and Cristobalite (respirable), Calcium Oxide and Nuisance Dusts (such as Portland Cement, Metal oxides, Limestone and other Calcium compounds)

Specific Chemical Identity: Silica Dioxide SiO2 (CAS 14808-60-7), Calcium Oxide (CAS 1305-78-8), Portland Cement (CAS 65997-15-1), Aluminum Oxide (CAS 1344-28-1), Iron Oxide (CAS 1309-37-1), Calcium Carbonate (CAS 1317-65-3), Calcium Hydroxide (CAS 1305-62-0), Calcium Silicate (CAS 1344-95-2)

Common Ingredients: Silica, Flint, Crystalline Free Silica, Quartz, Ground Silica, Silica Flour, Fly Ash, Cement, Rock, Gravel, Sand, Ground Granulated Blast Furnace Slag, Iron ore.

Admixtures and pigments are used in certain types of and colors of concrete unit paving products. However, the percent weight of the additives is not expected to exceed 1% of a typical concrete paving product. The additives are not expected to have any effect on the hazards presented by the use of these products. To obtain Material Safety Data Sheets for the additives for a specific formula, request them from the supplier.

Note- Chromium may be present as a trace contaminant in Portland cement at concentrations below applicable Hazard Communication Standard (HCS) reporting thresholds for MSDSs. Chromium compounds have been linked with cases of dermal sensitization and allergic contact dermatitis. See Sections VI and VII for additional information on health hazards and controls for concrete paving products.

Exposure Standards

	OSHA PEL-TWA	ACGIH TLV®-TWA (2006 version)	NIOSH REL-TWA
Crystalline Silica- Quartz and Cristobalite (Respirable dust)‡	$\frac{10 \text{ mg/m}^3}{\% \text{ Silica} + 2}$ for cristobalite, use ½ PEL calculated for Quartz	0.025 mg/m^3 (Quartz and Cristobalite)	0.05 mg/m^3 (Quartz and Cristobalite)
Nuisance Dusts (Portland Cement, Limestone/Calcium Carbonate, Calcium Silicate, Calcium Hydroxide§, Aluminum Oxide† and Iron Oxide ¥)	15 mg/m^3 (Total dust) 5 mg/m^3 (Respirable dust)	10 mg/m^3 (Total dust)	10 mg/m^3 (Total dust) 5 mg/m^3 (Respirable dust)
Calcium Oxide	5 mg/m^3 (Total dust)	2 mg/m^3 (Inhalable dust)	2 mg/m^3 (Total dust)

OSHA PEL-TWA = Occupational Safety and Health Administration Permissible Exposure Limit set for a typical 8-hour time-weighted average exposure.

ACGIH TLV-TWA = American Conference of Governmental Industrial Hygienists Threshold Limit Value for an 8-hour time-weighted average exposure.

NIOSH REL-TWA = National Institute for Occupational Safety and Health Recommended Exposure Limit set for a period up to a 10-hour workday and 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica (1974).

§ The ACGIH TLV and NIOSH REL for Calcium Hydroxide is 5 mg/m^3.

‡Respirable dust refers to that portion of dust passing through an appropriate size selective sampling device.

†In 1988 after a limited review of available scientific literature, NIOSH concluded that documentation cited by OSHA was inadequate to support a proposed PEL of 10 mg/m^3 for aluminum oxide. Presently, there is not a NIOSH REL listed for aluminum oxide in the NIOSH Pocket Guide to Chemical Hazards, Pub. No.97-140, 2004 version.

¥ The current NIOSH REL for Iron oxide is 5 mg/m^3 for Total Dust.

SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: N/A
Vapor Pressure: N/A
Vapor Density: N/A
Suitability in Water: Not Soluble
Appearance and Odor: Odorless Solid
Specific Gravity (H_20 = 1): N/A
Melting Point: N/A
Evaporation Rate: N/A

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): N/A
Flammable Limits: N/A **LEL:** N/A **UEL:** N/A
Extinguishing Media: N/A
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

SECTION V – REACTIVITY DATA

Stability: **Unstable:** **Stable:** X **Conditions to Avoid:** None
Incompatibility (Materials to Avoid): May react with strong acids due to the alkaline nature of materials used to produce concrete paving products.
Hazardous Decomposition or Byproducts: None
Hazardous Polymerization: May Occur: **Will Not Occur:** X **Conditions to Avoid:** X

The curing process for concrete products consumes oxygen and produces carbon dioxide (CO_2). Under normal conditions of storage and use for finished concrete paving products, this should not produce a hazardous environment. Storage and use of uncured concrete paving products in an enclosed or poorly ventilated area could lead to an oxygen deficient atmosphere. Adequate ventilation should be provided to minimize risks for oxygen deficiency. Atmospheric testing should be conducted if oxygen deficiency is suspected.

SECTION VI – HEALTH HAZARD DATA

Route(s) of Entry:
Inhalation? Yes **Skin Absorption?** No **Ingestion?** Yes
Health Hazards (Acute and Chronic):
Dry sawing or sanding of grinding of concrete unit paving products may result in the release of airborne dusts containing respirable crystalline quartz. Prolonged exposure to respirable crystalline quartz may cause delayed (chronic) lung injury (silicosis). Acute or rapidly developing silicosis may occur in a short period of time in heavy exposure. Silicosis is a form of disabling pulmonary fibrosis, which can be progressive and may lead to death. Individuals with silicosis have an increased risk for developing tuberculosis.

Dusts from concrete paving products are alkaline (pH>7) and can be corrosive to exposed skin and mucous membranes (eyes, nose and throat). Most dermal issues from concrete products are from contact with wet concrete. Handling of finished, dry concrete paving products should

produce no dermal effects except for mechanical abrasion. Some sensitive individuals may experience dermal irritation when dry concrete dusts contact moist skin.

One of the ingredients used to make finished concrete paving products, Portland Cement, has traces of Chromium compounds which has been associated with allergic contact dermatitis. Hexavalent chromium is considered a sensitizer so some individuals may experience dermal sensitization with adverse reactions even at low levels of exposure. Kidney damage has been linked to high dermal exposures.

Individuals who experience dermal irritation, reddening or ulceration of the skin or mucous membranes should seek prompt medical attention.

Carcinogenicity:

Finished concrete paving products are not carcinogenic according to NTP, IARC or OSHA classifications. Crystalline silica is a carcinogenic material expected to be present in dusts from concrete paving products above the OSHA HCS reporting thresholds. Traces of hexavalent chromium may be present as residual contamination in Portland Cement at thresholds believed to be below 0.1% in concrete paving product mixtures. The carcinogenic properties for hexavalent chromium are from inhalation of exposed dusts.

NTP: Yes

The National Toxicology Program (NTP) published its Eleventh Annual Report on Carcinogens which concludes that "Silica, Crystalline (respirable size)" and "Chromium, Hexavalent" are known to be human carcinogens. The NTP conclusion is based on sufficient evidence for the carcinogenicity in humans.

IARC Monograph? Yes

IARC Monographs on the Evaluation of the Carcinogen Risk of Chemicals to Humans (volume 68, 1997) concludes that there is sufficient evidence for the carcinogenicity of crystalline silica to humans. IARC Class 1. IARC Monograph (volume 49, 1990) concludes there is sufficient evidence for the carcinogenity of hexavalent chromium compounds in humans. IARC Class 1.

OSHA? Crystalline silica is not presently treated as a carcinogen in 1910.1000 Table Z-3, Mineral Dusts. Hexavalent chromium compounds are not presently treated as carcinogenic.

Signs and Symptoms of Exposure: Undue breathlessness, wheezing, cough and sputum production are indications of exposure to inhaled dusts containing silica. Irritation, redness, dermatitis, rashes or ulcerations of the skin are indications of dermal exposure to alkaline dusts or dusts containing chromium compounds.

Medical Conditions Generally Aggravated by Exposure:

Pre-Existing lung diseases such emphysema or asthma: Pulmonary function may be reduced by inhalation of respirable crystalline silica. Also lung scarring produced by such inhalation may lead to a progressive massive fibrosis of the lung which may aggravate other pulmonary conditions and diseases and which increases susceptibility to pulmonary tuberculosis. Progressive massive fibrosis may be accompanied by right heart enlargement, heart failure, and pulmonary failure. Smoking aggravates the effects of exposure.

Emergency and First Aid Procedures:

For sand in eyes during dry sawing, sanding and grinding operations, immediately flush generously with water for 15 minutes. If irritation persists, seek medical attention. For gross inhalation, remove person immediately to fresh air, give artificial respiration as needed, and seek medical attention as needed.

SECTION VII – PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled:

Use feasible wet methods to minimize airborne dusts for handling and finishing tasks that could generate airborne dusts. When dry sawing, sanding or grinding, use dustless system for handling, storage, and clean-up so that airborne dust does not exceed the PEL. Use adequate ventilation and dust equipment. Practice good housekeeping. Do not permit dust to collect on walls, floors, pavement, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. Wash or vacuum clothing which becomes dusty. See also control measures in Section VIII.

Waste Disposal Method:

Normal breakage may be picked up and discarded as common waste. Residue from dry sawing, sanding and grinding operations should be disposed of in accordance with Federal, Provincial, State, or Local regulations.

Precautions to be Taken in Handling and Storage: None

Other Precautions:

See OSHA Hazard Communication Rule 29 CFR Section 1910.1200, 1915.1200, 1917.1(a)(2)(vi). 1918.1(b)(4), 1926.59, and 1928.21(a), and state and local worker community "right to know" laws and regulations. We recommend that smoking be prohibited in all areas where respirators must be used. WARN YOUR EMPLOYEES (AND YOUR CUSTOMER – USERS IN CASE OF RESALE) BY POSTING, AND OTHER MEANS, OF THE HAZARDS AND OSHA PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT THE OSHA PRECAUTIONS.

See also American Society for Testing and Materials (ASTM) Standard Practice E1132-99a, "Standard Practice for Health Requirements Relating to Occupational Exposure to Quartz Dust."

Also, see NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica, April 2002, available at www.cdc.gov/niosh.topics/silica.

SECTION VIII – CONTROL MEASURES

Respiratory Protection

*Only NIOSH-approved respiratory protection equipment should be used. _All respiratory protection devices should be selected for your work environment based upon an adequate exposure evaluation using accepted industrial hygiene evaluation techniques. Since it is the respirable fraction of dust that is of medical significance for crystalline silica, High Efficiency Filtration Arresting (HEPA) filtration should be considered as part of a thorough assessment of exposures and controls. Any use of respiratory protection devices for exposure control should be done following legal requirements found in 29CFR 1910.134, the OSHA standard for Respiratory Protection. An industrial hygiene professional should be consulted for assistance with respirator selection or respirator program assistance.

See ANSI Z88.2 latest edition, "Practices for Respiratory Protection" and NIOSH "Respirator Selection Logic 2004", DHHS (NIOSH) Pub. 2005-100 for additional information on respiratory protection.

Ventilation:

Local Exhaust: When dry sawing, sanding or grinding concrete unit paving products, use sufficient local exhaust to reduce the level of respirable dust to the PEL. See ACGIH "Industrial Ventilation, A Manual of Recommended Practice," latest edition.

Mechanical
See "Other Precautions" under Section VII.
Special
See "Other Precautions" under Section VII.
Other
See "Other Precautions" under Section VII.
Protective Gloves
Use impervious gloves to prevent mechanical abrasion and skin contact with wet or dry concrete dusts.
Eye Protection
When sawing, sanding or grinding concrete unit paving products, wear protective shield or tight fitting goggles (safety glasses).
Other Protective Clothing or Equipment
When sawing, sanding or grinding concrete unit paving products, wear ear protection (ear plugs) and impervious materials for protection of exposed skin.
Work//Hygienic Practices

Avoid creating and breathing dust. See “Other Precautions” under Section VII.

The information and recommendations contained herein are based upon based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful health effect, which may be caused by exposure to airborne dust particles created by dry sawing or grinding of concrete unit paving products. Customers/users of concrete unit paving products must comply with all applicable health and safety laws, regulations, and orders.