SAFETY DATA SHEET

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SECTION 1. IDENTIFICATION

Materials Name:	CEM-I Portland Cement
Other Designations:	Hydraulic Cement, Portland Cement Silicate
Description:	Tricalcium silicate ($3CaO.SiO_2$) and Dicalcium silicate ($2CaO.SiO_2$) are portland cement's essential constituent, along with varying amount of alumina, tricalcium aluminate and iron oxide as tetracalcium aluminoferrate. Small amounts of magnesia, sodium, potassium and sulfur are also present. Chromium may be present in the finished cement since the kiln's refractory lining and steel balls used in the finish-milling operations are possible sources. To improve adhesion, strength and flexibility, cement may be modified with various plastic latexes.
CAS Reg. No.:	65997-15-1
DOT Classification:	Not Hazardous by DOT classifications
Supplier:	EnGro Corporation Limited

SECTION 2. HAZARDS IDENTIFICATION

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Category Classification(s): SKIN CORROSION/IRRITATION - Category 1
EYE DAMAGE - Category 1
SKIN SENSITIZATION - Category 1
CARCINOGENICITY/INHALATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)
[Respiratory tract irritation] – Category 3

GHS label elements

Hazard pictograms:

Signal word: Danger

Hazard statements: Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause respiratory irritation.
May cause cancer.

Precautionary Statements: Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.
Wash clothing, face and hands thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Wear eye protection, protective clothing and protective gloves.

SECTION 3. COMPOSITION / HAZARDOUS INFORMATION ON INGREDIENTS

Hazardous Components	Typical Percent (%)	*Limits and Toxicity Data
CaO (calcium oxide)	63-67	8 hr. TWA-PEL
SiO_2 (silicon dioxide)	20-24	10 mg/m^3 (total dust)
Al_2O_3 (aluminum oxide)	3-7	
Fe_2O_3 (iron III oxide)	2.1-4.1	8 hr. TWA-PEL
SO_3 (sulfur trioxide)	1.0-3.0	5 mg/m^3 (respirable fraction)
MgO (magnesium oxide)	1.0-4.0	
K_2O (potassium oxide)	0.2-1.0	AGGIH TLV-TWA
Na_2O (sodium monoxide)	0.1-1.0	10 mg/m^3 (nuisance dust)
Mn_2O_3 (manganese trioxide)	0.1-0.4	No toxicity data documented

*Limits set for the compound as a whole, **NOT** the individual components.

SECTION 4. FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Contact medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under eye lids, with copious amounts of water until victim is transported to an emergency medical facility. ***Contact the physician immediately! This material can cause corneal edema!***

Inhalation: Move the victim to fresh air. If breathing is difficult, give oxygen; if victim is not breathing, give artificial breathing. Contact medical assistance if necessary.

Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, have the conscious victim drink 4 to 8 oz. of milk or water. Contact the physician immediately.

Note to Physician: Ingestion of large amounts of cement is unlikely. However, to prevent re-exposing the esophagus and the stomach, do not induce emesis or perform gastric lavage. Immediate dilution may prevent esophageal burns.

For severe esophageal burns, consider esophagocopy within the first 24 hours. Neutralization with acidic agents is not advised because of the increased risk of exothermic burns. Water-mineral oil soaks may aid in the removal of hardened cement from the skin.

Dried on cement is extremely difficult to remove; surgical debridement and possibly even skin grafting may be necessary. Consult an ophthalmologist for ocular burns. Consider topical mydriatic-cyclopelegics to guard against development for posterior synechiae and ciliary spasm.

SECTION 5. FIRE-FIGHTING MEASURES

Flash Point:	Non-combustible
Extinguishing Media:	This media is non-combustible. Use extinguishing media that is appropriate to the surrounding fire (FPN).
Special Fire Fighting Procedures:	Since the fire may produce toxic fumes, wear a self contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode
Unusual Fire & Explosion Hazards:	None reported
Flammable Limits in Air (Volume %):	N/A
Lower Explosive Limit:	N/A
Upper Explosive Limit:	N/A

SECTION 6. ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled: Use dry clean-up methods that do not disperse dust into the air. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment. Scrape up wet material and place in an appropriate container. Allow the material to "dry" before disposal.

SECTION 7. HANDLING AND STORAGE

Neutralizing Agent:	None specified by manufacturer
Precautions – Handling and Storing:	None
Housekeeping:	Avoid actions cause the cement to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA Vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below

Do not store or handle near food and beverages or smoking materials

Respirable dust may be generated during processing, handling and storage. The personal protection and controls identified in Section 8 of SDS should be applied as appropriate

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection:	The use of a NIOSH/MSHA approved respirator is recommended, based on airborne concentrations
Ventilation:	Local exhaust can be used to control airborne dust levels
Protective Gloves:	Impervious gloves (FPN)
Eye Protection:	ANSI approved chemical work goggles (FPN)
Other Protective Equipment:	EMER eyewash & DLUGE SHWR meeting ANSI design criteria (FPN). Use BARR creams, boots & clothing to protect skin (SUPDAT)
Work Hygienic Practices:	Immediately after working with cement, shower with soup & water, Precaution must be observed because cement burns with little warning.

SECTION 9. PHYSICAL / CHEMICAL CHARACTERISTICS

Appearance and Odor:	Grey (or white) powder and no odor
Vapor Pressure (mm Hg / 70^0F):	0 mm
Specific Gravity (H_2O=1):	3.15
Vapor Pressure:	N/A
Evaporation Rate:	N/A
Vapor Density:	N/A
pH:	12 (wet cement)
Boiling Point	N/A
Solubility in Water:	Slightly (0.1-1.0%)

SECTION 10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions to Avoid (Stability):	Avoid moisture. Keep dry until used
Materials to Avoid:	None
Incompatibility:	None
Hazardous Decomposition/By-products:	None
Hazardous Polymerization:	Not relevant

SECTION 11. TOXICOLOGICAL

Route of Entry: Inhalation, Skin and Ingestion

Health Hazard (Acute and chronic): Portland cement is a nuisance dust and an irritant to skin, eyes and mucous membranes. Its principle health hazard occurs from the formation of alkaline calcium hydroxide (forming from the addition of water to Portland cement), and this material is abrasive and can burn the skin. Dry cement will not cause alkaline burns. Some individuals appear to tolerate brief contact with wet cement but others develop extensive skin burns. Repeated or prolong skin exposure can cause dermatitis, including skin dryness, fissures, eczematous rashes and dystrophy of the nails. Extensive burns with dermal necrosis can occur. Allergic dermatitis may result from the presence of heavy metal such as chromium in the mixture.

Splashes into the eyes can cause corneal edema. Ingestion of the powder may cause burns in the esophagus and stomach. Chronic bronchitis may result from long term exposure. There are reports of x-ray changes without symptoms in cement workers exposed to Portland cement. Other studies showing x-rays changes with pulmonary symptoms are noted in workers exposed primarily to the silica-containing products in Portland cement.

Signs and Symptoms of Exposure: Inhalation symptoms include eye, nose and upper respiratory tract irritation, cough, expectoration, shortness of breath and wheezing. Within 12 to 48 hours after 1 to 6 hours exposures, first second and third degree burns may occur. There may be no obvious pain at the time of exposure. Allergic reactions and changes in x-rays are also sign of exposure.

Medical Conditions Aggravated By Exposure: Individuals with a sensitivity to hexachromium salts should avoid exposure. Individuals with chronic respiratory disorder or skin diseases should minimize exposure.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		x
In the International Agency for Research (IARC) Monographs		x
By the Occupational Safety and Health Administration (OSHA)		x

Explanation Carcinogenicity: **Not relevant**

SECTION 12. ECOLOGICAL INFORMATION

For questions regarding Ecological Information refer to contact information in Section 1.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Disposal must be in accordance with applicable federal, state, and local laws and regulations (FPN). Material can be returned to container for later use, or it can be disposed of as a common non hazardous material.

SECTION 14. TRANSPORT INFORMATION

The product is not covered by the international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID) and therefore no classification is required.

SECTION 15. REGULATORY INFORMATION

For Regulatory information refer to contact EnGro Corporation Limited

SECTION 16. OTHER INFORMATION

Reference Sources:

1. Genium Publishing Corporation, MSDS No. 718, August, 1990 Hawley's Condensed Chemical Dictionary, 11th edition, 1987.
2. MSDS Serial Number: BTXYJ, 09 Nov' 90 California Portland Cement Co. US. COLTON.
3. In-house test reports of EnGro Central Laboratory

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Note: Physical and chemical data contained in this SDS are provided for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references. However, EnGro Corporation Limited does not certify the data on the SDS. The certified values for this material are given only on the EnGro Corporation Certificate of Analysis.