



# SAFETY DATA SHEET

## SECTION 1 – PRODUCT IDENTIFICATION

### Product Identifier

**Product Name:** Portland Cement Clinker

**Synonyms:** Clinker, cement clinker

**Product Form:** Solid

**Intended Use of Product:** Portland cement clinker is the product of high temperature calcination of a mixture of minerals and when blended with other materials is used to manufacture portland cement. Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

**Note:** This SDS covers many types of Portland cement. Individual composition of hazardous constituents will vary between types of Portland cement

**Prepared by:** Nahavand Cement HSE unit

### Name, Address and Telephone of Responsible Party

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## SECTION 2 – HAZARDS IDENTIFICATION

### Classification of the Substance or Mixture

Classification (GHS-US)

Skin Corrosion 1B Eye Damage 1 Skin Sensitizer 1B  
Specific Target Organ Toxicity: Single Exposure (Lungs) 3

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

Precautionary Statements

- |                   |  |
|-------------------|--|
| <b>Prevention</b> | <b>Do not breathe dust.</b><br>Wear protective gloves/protective clothing/eye protection/face protection Wash thoroughly after handling.<br>Do not handle until all safety precautions have been read and understood.  |
| <b>Response</b>   | <b>If inhaled:</b> Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center/doctor.<br>If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor.<br><b>If on skin:</b> Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse.<br><b>If swallowed:</b> Rinse mouth. Do NOT induce vomiting. Immediately call a poison center/doctor. Store locked up. |
| <b>Storage</b>    |  |
| <b>Disposal</b>   | Dispose of contents/container in accordance with local/state/national regulations.   |
- Exposure may aggravate those with pre-existing eye, skin or respiratory conditions or illness.

Other Hazards

### SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Component/Ingredient	CAS#	Percent Present (Range)
Tricalcium silicate	12168-85-3	50-70
Dicalcium silicate	10034-77-2	10-30
Tetracalcium aluminoferrite	12068-35-8	5-20
Tri-calcium Aluminate	12042-78-3	1-9
Magnesium oxide	1309-48-4	1-3
Nuisance Dusts (Particulates not otherwise regulated)	None	< 1-5
Crystalline Silica (Quartz)	14808-60-7	0 - <1

#### Other Components

Portland cement clinker is made from materials mined from the earth and processed using energy provided by fuels. Additional materials, such as, kiln dust and slag may also be introduced into the manufacturing process. A chemical analysis of portland cement clinker may reveal trace amounts of naturally occurring but potentially harmful chemical compounds such as free crystalline silica, organic compounds, calcium oxide, potassium and sodium compounds, heavy metals including cadmium, chromium (including hexavalent chromium), nickel and lead.

### SECTION 4 – FIRST AID

#### Description of First Aid

<b>Eyes</b>	Rinse eyes and under lids cautiously with clean water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.
<b>Skin</b>	Remove contaminated clothing. Remove dry material from skin, but avoid creating dust. Wash with plenty of water. If skin irritation occurs, get immediate medical advice/attention.
<b>Inhalation</b>	Remove person to fresh air away from dust and keep comfortable for breathing. If coughing persists, obtain medical attention.
<b>Ingestion</b>	Do not induce vomiting. If subject is conscious, rinse the mouth with water to remove any material and drink plenty of water to dilute any swallowed material. Do not give drink or attempt to force water to an unconscious person. Get medical advice/attention.

#### Important Symptoms and Effects (Acute and Delayed)

<b>Eyes</b>	Causes serious eye irritation and may scratch eye surface due to particle abrasion. May cause chemical burns resulting in corneal damage.
<b>Skin</b>	Causes skin irritation if exposed to moisture on skin creating redness, dryness and itching. Extended exposure to wet material will result in chemical burns to skin, possibly severe.
<b>Inhalation</b>	May irritate nose and throat if dust is inhaled. Prolonged or repeated inhalation of respirable dust may lead to respiratory tract or lung damage.
<b>Ingestion</b>	May cause irritation and burns of mouth, throat, stomach and digestive tract if swallowed.

#### Recommendations for Immediate Medical Care or Special Treatment

Seek immediate medical attention for inhalation of large quantities of dust or exposure of wet material over large areas of skin. Seek immediate medical attention if material comes into contact with eyes and cannot be immediately removed.

### SECTION 5 – FIRE FIGHTING

<b>General Fire Hazards</b>	None. Material is not considered flammable or combustible.
<b>Extinguishing Media</b>	Use water or water spray to extinguish any fires involving this material.
<b>Extinguishing Media to Avoid</b>	None.
<b>Hazards of Combustion</b>	None.
<b>Fire Fighting Recommendations</b>	Firefighters should always wear full protective gear to fight any fire.

Refer to Section 9 for flammability information.

### SECTION 6 – ACCIDENTAL RELEASE MEASURES

<b>Precautions</b>	Avoid creating dust. Prevent material from entering sewers, drains, ditches or waterways.
<b>Personal Protection</b>	Wear respiratory protection and protective eyewear/clothing to avoid eye or skin contact. Ventilate area and avoid creating dust. Remove unnecessary persons from area.
<b>Emergency Procedures</b>	Barricade solid material to prevent additional spillage.
<b>Containment Procedures</b>	Scoop or vacuum up spilled material while avoiding dust creation. Scoop up wet material and place in approved container. Allow wet material to harden before disposal.
<b>Clean Up Procedures</b>	

## SECTION 7 – HANDLING AND STORAGE

<b>Safe Handling Practices</b>	Avoid contact with skin or eyes. Avoid breathing dust. Use only in well ventilated areas. Wear appropriate personal protective equipment to prevent eye or skin contact and use respiratory protection equipment if dusty or in poorly ventilated areas.
<b>Safe Storage Measures</b>	Store in well-ventilated areas away from moisture and incompatible materials. If stored in containers, keep containers closed when not in use.
<b>Incompatible Materials</b>	Water/moisture exposure will cause material to generate heat. Keep away from fluoride compounds, strong acids, alkalines, and oxidizers. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas.

## SECTION 8 – EXPOSURE CONTROLS & PERSONAL PROTECTION

### Exposure Limits for Individual (T= Total Respirable, R=Respirable fraction, I=Inhalable-aerosol)

Component	OSHA PEL	ACGIH TLV	NIOSH REL
Tricalcium silicate	15 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)	Not listed	10 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)
Dicalcium silicate	15 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)	Not listed	10 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)
Tetracalcium aluminoferrite	15 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)	Not listed	10 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)
Tri-calcium aluminate	15 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)	Not listed	10 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)
Magnesium oxide	15 mg/m <sup>3</sup>	10 mg/m <sup>3</sup> (I)	Not established
Nuisance Dusts (PNOR)	15 mg/m <sup>3</sup> (T); 5 mg/m <sup>3</sup> (R)	10 mg/m <sup>3</sup>	Not established
Crystalline Silica (Quartz)	10 mg/m <sup>3</sup> (R) /( % SiO <sub>2</sub> + 2) 30 mg/m <sup>3</sup> (T) /( % SiO <sub>2</sub> + 2)	0.025 mg/m <sup>3</sup> (R)	0.05 mg/m <sup>3</sup> (R)

### Exposure Controls

#### Engineering Controls

Use outdoors in well-ventilated areas; otherwise employ natural or mechanical ventilation to maintain exposure within applicable limits.

### Personal Protection

#### Face and Eyes

Avoid contact with skin or eyes. Avoid creating or breathing dust. Safety glasses with side shields or protective goggles should be worn while using this product. For extremely dusty conditions, non-vented goggles or goggles with indirect venting are recommended. Avoid contact lens wear when using this product.

#### Body

Long sleeved shirts and trousers should be worn while using this material. Wear water-proof boots. If working in dusty conditions, impervious over garments are recommended.

#### Respiratory

If exposure levels cannot be maintained below acceptable limits, suitable particulate-filtering facemasks or respirators approved by MSHA/NIOSH should be worn in accordance with the user's respiratory protection program and OSHA/MSHA guidelines.

#### Hands

Protective gloves with wrist/arm cuffs should be worn to avoid direct contact with skin.



## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State</b>	Solid, granules or lumps	<b>Specific Gravity</b>	3.1 – 3.2
<b>Appearance &amp; Color</b>	Dark grey – black nodules	<b>Flash Point/Method</b>	None. Not flammable.
<b>Odor</b>	None	<b>Auto Ignition Temperature</b>	Not determined
<b>pH</b>	>12 (in water)	<b>Lower Flammability Limit</b>	Not applicable
<b>Boiling Point</b>	Not applicable	<b>Upper Flammability Limit</b>	Not applicable
<b>Solubility (Water)</b>	Negligible (< 1%)	<b>Octanol/H<sub>2</sub>O Coefficient</b>	Not determined
<b>Evaporation Rate</b>	Not applicable	<b>Viscosity</b>	Not applicable
<b>Melting Point</b>	Not determined	<b>Freezing Point</b>	Solid at room temperature
<b>Vapor Density</b>	Not applicable	<b>Explosion Risk: Static</b>	Not considered a hazard
<b>Vapor Pressure</b>	Not applicable	<b>Explosion Risk: Shock</b>	Not considered a hazard

## SECTION 10 – STABILITY AND REACTIVITY

### Reactivity

Reacts with water to create heat and calcium hydroxide.

### Chemical Stability

Stable at standard temperature and pressures. None.

### Hazardous Reactions

Hazardous polymerization will not occur.

### Conditions to Avoid

Moisture or wetting will cause exothermic heating as product cures.

### Incompatible Materials

Avoid contact with strong acids, oxidizers, aluminum and ammonium salts.

### Decomposition Hazards

Reacts with water to form calcium hydroxide which can irritate/damage skin. Clinker dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas.

## SECTION 11 – TOXICOLOGICAL INFORMATION

Product: Portland cement clinker

<b>Acute Toxicity</b>	Not classified.
<b>LD50/LC50 Data</b>	Not classified.
<b>Skin Corrosion/Irritation Critical</b>	Causes irritation or chemical burns if exposed to moisture on skin. Causes
<b>Eye Damage/Irritation</b>	serious eye injury due to chemical burns or mechanical irritation. Not
<b>Respiratory or Skin Sensitization</b>	reported/no data available.
<b>Germ Cell Mutagenicity</b>	Not reported/no data available. Not
<b>Teratogenicity</b>	reported/no data available.
<b>Carcinogenicity</b>	Material may contain trace amounts of crystalline silica, which may cause lung
	cancer through repeated or prolonged exposure to dust.
	Not reported/no data available.
<b>Specific Organ Toxicity (Single Exposure)</b>	May cause damage/disease to lungs through repeated or prolonged exposure. Not
<b>Specific Organ Toxicity (Repeated Exposure)</b>	reported/no data available.
<b>Reproductive Toxicity</b>	Not reported/no data available.
<b>Aspiration Respiratory Hazard</b>	Coughing, sneezing, mucous discharge and dyspnea. Extended contact may lead to
<b>Symptoms: Inhalation</b>	chemical burns.
	Redness and itching. Extended contact may lead to chemical burns.
<b>Symptoms: Skin Contact</b>	Redness and itching. Extended contact may lead to corneal abrasion/ulceration.
<b>Symptoms: Eye Contact</b>	Irritation and chemical burns of mouth and throat.
<b>Symptoms: Ingestion</b>	No additional data available.
<b>Other Toxicological Information</b>	

Components	Toxicity	Carc: IARC	Carc: NTP	Carc: OSHA
Tricalcium silicate	No data	Not listed	Not listed	Not listed
Dicalcium silicate	No data	Not listed	Not listed	Not listed
Tetracalcium aluminoferrite	No data	Not listed	Not listed	Not listed
Tri-calcium Aluminate	No data	Not listed	Not listed	Not listed
Magnesium oxide	Oral LD50 Rat 810 mg/kg	Not listed	Not listed	Not listed
Nuisance Dusts (PNOR)	No data	Not listed	Not listed	Not listed
Crystalline Silica (Quartz) (refer to Section 16 for more information)	Oral LD50 Rat >22,500 mg/kg LC50 Carp >10,000 mg/L (72	Group 1	Known	Not listed

## SECTION 12 – ECOLOGICAL INFORMATION

<b>General Ecotoxicity</b>	Not classified.
<b>Persistence and Degradability</b>	Not reported/no data available. Not
<b>Bioaccumulation Potential</b>	reported/no data available. Not
<b>Mobility in Soil to Groundwater</b>	reported/no data available. Not
<b>Environmental Fate</b>	reported/no data available.
<b>Other Environmental</b>	Avoid release to the environment. Prevent material from entering sewers, drains, ditches or
<b>Precautions or Information</b>	waterways.
<b>Ecology - Waste Materials:</b>	<b>Avoid release to the environment.</b>

## SECTION 13 – DISPOSAL CONSIDERATIONS

<b>Disposal Methods</b>	Dispose as an inert, non-metallic mineral in accordance with applicable federal, state, and local regulations.
<b>Special Considerations</b>	Avoid creation or breathing dust during disposal. Avoid contact with skin and eyes. Prevent
<b>Other Disposal Information</b>	material from entering sewers, drains, ditches or waterways.

## SECTION 14 – TRANSPORT INFORMATION

<b>Proper Shipping Name</b>	N/A – not regulated.
<b>Hazard Class</b>	N/A – not regulated.
<b>UN Shipping ID Number</b>	N/A – not regulated.
<b>Packing Group</b>	N/A – not regulated.
<b>Environmental/IMDG Codes</b>	N/A – not regulated.

**SECTION 15 – REGULATORY INFORMATION****Additional information regarding portland cement products:**

Wet portland cement products can cause caustic burns to unprotected skin, sometimes referred to as cement burns. Cement burns may result in blisters, dead or hardened skin, or black or green skin. In severe cases, these burns may extend to the bone and cause disfiguring scars or disability.

Employees cannot rely on pain or discomfort to alert them to cement burns because cement burns may not cause immediate pain or discomfort. By the time an employee becomes aware of a cement burn, much damage has already been done. Accordingly, the safest method to use portland cement products is to avoid contact with exposed skin completely. Cement burns can get worse even after skin contact with cement has ended. Any employee experiencing a cement burn is advised to see a health care professional immediately.

Skin contact with wet portland cement products can also cause inflammation of the skin, referred to as dermatitis. Signs and symptoms of dermatitis can include itching, redness, swelling, blisters, scaling, and other changes in the normal condition of the skin. Contact with wet portland cement products can cause a non-allergic form of dermatitis (called irritant contact dermatitis) which is related to the caustic, abrasive, and drying properties of portland cement.

In addition, hexavalent chromium [Cr(VI)] which may be found in portland cement products in trace amounts, can cause an allergic form of dermatitis (allergic contact dermatitis, or ACD) in sensitized employees who work with the wet material. When an employee is sensitized, that person's immune system overreacts to small amounts of Cr(VI), which can lead to severe inflammatory reactions upon subsequent exposures. Sensitization may result from a single Cr(VI) exposure, from repeated exposures over the course of months or years, or it may not occur at all. After an employee becomes sensitized, brief skin contact with very small amounts of Cr(VI) can trigger ACD. ACD is long-lasting and employees can remain sensitized to Cr(VI) years after their exposure to portland cement has ended. Medical tests (e.g. skin patch tests) are available that can confirm whether an employee has become dermally sensitized to Cr(VI).

Employees who work with portland cement products 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.

**Additional information regarding crystalline silica:**

The major concern is silicosis, caused by the inhalation and retention of respirable (extremely small) crystalline silica dust particles. Silicosis can exist in several forms. Chronic or ordinary silicosis (often referred to as simple silicosis) is the most common form of silicosis, and can occur after many years of exposure to relatively low concentrations of airborne respirable crystalline silica dust. Complicated silicosis or progressive massive fibrosis (PMF) may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease. Acute silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis can be fatal.

IARC: The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs."

NTP: The National Toxicology Program (NTP), in its Thirteenth Annual Report on Carcinogens, classified "silica, crystalline

OSHA: Crystalline silica (quartz) is not regulated as a human carcinogen by the Occupational Safety and Health

**Other important information:**

While the information provided in this document is believed to provide a useful summary of the hazards of portland cement clinker, 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 portland cement clinker. 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. Nahavand cement co believes the information contained herein is accurate; however, Nahavand cement Co makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein which is not intended to be and should not be construed as. Any party using this product should review all such laws, rules, or regulations prior to use..

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