

# Material Safety Data Sheet

## for

### PORTLAND CEMENT

#### Section 1 - IDENTIFICATION

Product Names: Mountain Cement Portland Cement - Types I/II, V, Oilwell Class G

#### MSDS Information

This MSDS was produced in May 1999 and replaces any prior versions.

#### Product Code

Standard Industrial Classification: 3241

#### Chemical family

Calcium compounds. Calcium silicate compounds and other calcium compounds containing iron and aluminum make up the majority of this product. Major compounds:

$3\text{CaO} \cdot \text{SiO}_2$	Tricalcium silicate	CAS#12168-85-3
$2\text{CaO} \cdot \text{SiO}_2$	Dicalcium silicate	CAS#10034-77-2
$3\text{CaOAl}_2\text{O}_3$	Tricalcium aluminate	CAS#12042-78-3
$4\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{Fe}_2\text{O}_3$	Tetracalcium aluminoferrite	CAS#12068-35-8
$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	Calcium sulfate dihydrate or Gypsum	CAS#7778-18-9

#### Chemical name and synonyms

Portland cement. Also known as hydraulic cement.

#### Formula

This product consists of finely ground portland cement clinker mixed with a small amount of calcium sulfate.\*

#### Supplier/Manufacturer

Mountain Cement Company

5 Sand Creek Road

Laramie, WY 82070

#### Emergency contact information

Scott Nielson 307-745-4879, Ext. 121

\*Trace Elements

Portland cement is made from materials mined from the earth and is processed using energy provided by fuels; and therefore may contain trace amounts of naturally occurring materials which might be detected during chemical analysis. For example: Portland cement may contain up to 0.75% insoluble residue, of which <0.1% may be free crystalline silica. Other trace constituents may include potassium and sodium sulfate compounds, chromium compounds, and nickel compounds.

**Section 2 - COMPONENTS**

	OSHA PEL	ACGIF TLV-TWA	NIOSH REL
<b><u>Hazardous Substances</u></b>	<b><u>(8-hour TWA)</u></b>	<b><u>(1995-1996)</u></b>	<b><u>(8-Hour TWA)</u></b>
Portland Cement Clinker (CAS #65997-15-1)	50 million particles/ft <sup>3</sup>	10mg total dust/m <sup>3</sup>	
Nominal 95% by weight			
Calcium sulfate (CAS #7778-18-9)	5mg respirable dust/m <sup>3</sup>	10mg total dust/m <sup>3</sup>	
[Gypsum (CAS #13397-24-5)]	10mg total dust/m <sup>3</sup>		
Nominal 5% weight			
Calcium oxide (CAS #1306-78-8)	5mg/m <sup>3</sup>	2mg/m <sup>3</sup>	
(Free Lime)			
< 4% by weight			
Magnesium Oxide (CAS #1309-48-4)	15mg total dust/ m <sup>3</sup>	10mg total dust/m <sup>3</sup>	
< 5% by weight			

**Section 3 - HAZARDS IDENTIFICATION/TOXICOLOGICAL INFORMATION**

**Emergency Overview:**

Portland cement is a light gray 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 cement can cause serious, potentially irreversible tissue (including 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 cement.

**Potential Health Effects:**

Potential 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 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.

Potential 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 or avoiding skin contact, particularly contact with wet cement. Persons exposed to wet cement may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Exposure to dry portland cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Dry portland cement contacting wet skin or exposure to moist or wet portland 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 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 experience this effect after years of contact with hydraulic cement products.

Potential effects resulting from **inhalation:**

Portland cement may contain trace amounts (<0.1%) of free crystalline silica. Prolonged exposure to respirable free crystalline silica may aggravate other lung conditions. It may also cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease.

Exposure to portland 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.

Potential effects resulting from **ingestion:**

Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed. Portland cement should not be eaten under any circumstances.

**Carcinogenic Potential:**

Portland cement is not listed as a carcinogen by IARC, NTP, or OSHA. It may, however, contain trace amounts (<0.1%) of substances listed as carcinogens by these organizations. Crystalline silica is now classified by IARC as a known human carcinogen (Group I). NTP had characterized respirable crystalline silica as "reasonably anticipated to be (a) 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**

Immediately 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 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 & 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 portland cement poses 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 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 an appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash portland cement down drains.

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

### **Section 7 - HANDLING AND STORAGE**

Keep portland cement dry until used. Normal temperature and pressure 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 avoiding potentially severe skin injury. Avoid contact with unhardened (wet) portland cement products. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened portland cement products might occur, wear impervious clothing and gloves to eliminate skin contact.

#### **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 respirators in poorly ventilated areas when dust causes discomfort or irritation, or where there is an applicable exposure limit (Advisory: Respirators and filters purchased after July 10, 1998 must be certified under 42 CFR 84).

#### **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 or concrete 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 cement or fresh cement products.

## **Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	Gray or White powder
Odor	No distinct odor
Physical state	Solid (powder)
pH (in water) (ASTM D 1293-95)	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 (i.e., > 1000° C)
Melting point	Not applicable
Specific gravity (H <sub>2</sub> O = 1.0)	3.15
Evaporation rate	Not applicable

## **Section 10 - STABILITY AND REACTIVITY**

### **Stability**

Stable

### **Conditions To Avoid**

Unintentional contact with water

### **Incompatibility**

Wet portland 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 – See Section 3**

## 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, including bags, according to local, state and federal regulations.

## Section 14 - TRANSPORTATION DATA

### Hazardous Materials Description/Proper Shipping Name

Portland cement is not hazardous under U.S. Department of Transportation (DOT) regulations.

## Section 15 - OTHER REGULATORY INFORMATION

### Status Under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200

Portland cement 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 (v)

Not listed.

### Hazard Category Under SARA (Title III) Section 311 and 312

Portland cement qualifies as a "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 portland cement are on the TSCA inventory list.

### Status Under the Federal Hazardous Substances Act

Portland cement is a "hazardous substance" subject to the statutes promulgated under the subject act.

### Status Under WHMIS

Portland cement is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products regulations (Class E - corrosive material) and is therefore subject to the labeling and MSDS requirements of the workplace hazardous information system (WHMIS).

## Section 16 - OTHER INFORMATION

### Prepared By

Mountain Cement Company

5 Sand Creek Rd.

Laramie, WY 82070

**Revision Date**

May 1999

**Other Important Information**

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

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot, and does not, 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 portland cement products. Users, therefore, should review other applicable material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

MOUNTAIN CEMENT MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY MOUNTAIN CEMENT COMPANY, EXCEPT THAT THE PRODUCT SHALL CONFORM TO CONTRACTED SPECIFICATIONS. THE INFORMATION PROVIDED HEREIN WAS BELIEVED BY MOUNTAIN CEMENT COMPANY 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 NON-DELIVERY OF PRODUCT, AND WHETHER BASED ON CONTRACT, BREACH OF 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 SHALL MOUNTAIN CEMENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BUYER'S CLAIM IS BASED ON CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHERWISE.