

## SAFETY DATA SHEET

### 1. SUBSTANCE AND SOURCE IDENTIFICATION

**Product Identifier**

**SRM Number:** 633a  
**SRM Name:** Portland Cement  
**Other Means of Identification:** Not applicable.

**Recommended Use of This Material and Restrictions of Use**

This Standard Reference Material (SRM) is intended primarily for the evaluation of methods for analysis of cements and materials of similar matrix. A unit of SRM 633a consists of four vials, each containing approximately 5 g of portland cement ground to pass through a 75 µm (No. 200) sieve, and each sealed into a foil pouch.

**Company Information**

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### 2. HAZARDS IDENTIFICATION

**Classification**

|                         |                           |            |
|-------------------------|---------------------------|------------|
| <b>Physical Hazard:</b> | Not classified.           |            |
| <b>Health Hazard:</b>   | Skin Corrosion/Irritation | Category 2 |
|                         | Eye Damage/Irritation     | Category 1 |
|                         | STOT, Single Exposure     | Category 3 |

**Label Elements**

**Symbol**



**Signal Word**

DANGER

**Hazard Statement(s)**

|      |                                   |
|------|-----------------------------------|
| H315 | Causes skin irritation.           |
| H318 | Causes serious eye damage.        |
| H335 | May cause respiratory irritation. |

**Precautionary Statement(s)**

|           |   |
|-----------|---|
| P261      | Avoid breathing dust.                             |
| P264      | Wash hands thoroughly after handling.             |
| P271      | Use only outdoors or in a well-ventilated room.   |
| P280      | Wear protective gloves and eye protection.        |
| P302+P352 | If on skin: Wash with plenty of water.            |
| P332+P313 | If skin irritation occurs: Get medical attention. |

|                |   |
|----------------|---|
| P305+P351+P338 | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. |
| P310           | Immediately call a doctor.  |
| P304           | If inhaled: Remove person to fresh air and keep comfortable breathing.  |
| P312           | Call a doctor if you feel unwell.   |
| P362+P364      | Take off contaminated clothing and wash it before reuse.  |
| P403+P233      | Store in a well-ventilated place. Keep container tightly closed.  |
| P405           | Store locked up.  |
| P501           | Dispose of contents and container according to local regulations.   |

**Hazards Not Otherwise Classified:** None.

**Ingredients(s) with Unknown Acute Toxicity:** None.

### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

**Substance:** Portland cement

**Other Designations:** Hydraulic cement; cement (portland); silicate, portland cement; portland cement silicate.

Components are listed in compliance with OSHA's 29 CFR 1910.1200. Cement may contain trace amounts of oxides and other chemicals due to the starting materials and manufacturing process, including chromium compounds. This SDS is for portland cement with <0.1% of quartz. Actual concentrations for constituents in SRM 633a are listed in the NIST Certificate of Analysis.

| Hazardous Component(s)     | CAS Number | EC Number<br>(EINECS) | Nominal Mass Concentration<br>(%) |
|----------------------------|------------|-----------------------|-----------------------------------|
| Portland cement            | 65997-15-1 | 266-043-4             | >99.9                             |
| Silica, crystalline quartz | 14808-60-7 | 238-878-4             | <0.1                              |

### 4. FIRST AID MEASURES

#### Description of First Aid Measures

**Inhalation:** If adverse effects occur, remove to well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

**Skin Contact:** Rinse affected skin with water for at least 15 minutes, and then wash thoroughly with soap or mild detergent and water. If skin irritation persists, seek medical aid and bring the container or label.

**Eye Contact:** Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** If a large amount is swallowed, seek medical attention.

**Most Important Symptoms/Effects, Acute and Delayed:** Inhalation of dust particles may cause irritation. Prolonged exposure to respirable silica particles can cause lung damage (silicosis) and cancer.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek immediate medical attention.

### 5. FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

#### Extinguishing Media

Suitable: Use extinguishing agents appropriate to surrounding fire.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** Not applicable.

**Special Protective Equipment and Precautions for Fire-Fighters:** Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2

Fire = 0

Reactivity = 0

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Avoid generating dust. Collect in appropriate container for disposal.

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## 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** Use suitable personal protection equipment (PPE) to prevent skin and eye contact and inhalation of generated dust. See Section 8, "Exposure Controls and Personal Protection".

**Storage and Incompatible Materials:** Store in a well-ventilated area. Samples should be used immediately after opening the Mylar bag and vial.

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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| Exposure Limits            |   |   |  |
|----------------------------|---|---|--|
| Components                 | OSHA (PEL)  | ACGIH (TLV)   | NIOSH (REL)  |
| Portland Cement            | TWA: 15 mg/m <sup>3</sup> (total dust)<br>TWA: 5 mg/m <sup>3</sup> (respirable fraction)<br>TWA: 50 mppcf (<1 % crystalline silica)   | TWA: 1 mg/m <sup>3</sup> (respirable fraction, particulate matter containing no asbestos and <1 % crystalline silica) | TWA: 10 mg/m <sup>3</sup> (total dust)<br>TWA: 5 mg/m <sup>3</sup> (respirable dust)<br>IDLH: 5000 mg/m <sup>3</sup> |
| Silica, crystalline quartz | TWA: 30/(%SiO <sub>2</sub> + 2) mg/m <sup>3</sup> (total dust)<br>TWA: 10/(%SiO <sub>2</sub> + 2) mg/m <sup>3</sup> (respirable fraction)<br>TWA: 250/(%SiO <sub>2</sub> + 5) (mppcf respirable fraction) | TWA: 0.025 mg/m <sup>3</sup> (respirable fraction)  | TWA: 0.05 mg/m <sup>3</sup> (respirable dust)<br>IDLH: 50 mg/m <sup>3</sup> (respirable dust)                        |

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection Measures:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate PPE to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye Protection:** Splash resistant safety goggles and emergency eyewash are recommended.

**Skin and Body Protection:** Chemical resistant clothing and gloves are recommended.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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| Descriptive Properties                           | Portland Cement       |
|--|-----------------------|
| Molar Mass (g/mol)                               | not applicable        |
| Molecular Formula                                | not applicable        |
| Appearance (physical state, color, etc.)         | white to gray powder  |
| Odor   | odorless              |
| Odor threshold                                   | not available         |
| pH   | 12 to 13 (wet cement) |
| Evaporation rate                                 | 0 %                   |
| Melting point/freezing point                     | not available         |
| Relative Density as Specific Gravity (water = 1) | 3.15                  |

| Descriptive Properties                  | Portland Cement     |
|---|---------------------|
| Density                                 | not available       |
| Vapor Pressure                          | not available       |
| Vapor Density (air = 1)                 | not applicable      |
| Viscosity                               | not applicable      |
| Solubilities                            | water: 0.1 % to 1 % |
| Partition coefficient (n-octanol/water) | not applicable      |
| Particle size                           | <75 µm              |
| Thermal Stability Properties            |                     |
| Autoignition Temperature                | not applicable      |
| Thermal Decomposition                   | not applicable      |
| Initial boiling point and boiling range | not applicable      |
| Explosive Limits, LEL (Volume %)        | not applicable      |
| Explosive Limits, UEL (Volume %)        | not applicable      |
| Flash Point                             | not applicable      |
| Flammability (solid, gas)               | not applicable      |

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Stable at normal temperatures and pressure.

**Stability:**      Stable            Unstable

**Possible Hazardous Reactions:** Not applicable.

**Conditions to Avoid:** Avoid generating dust.

**Incompatible Materials:** No data available.

**Hazardous Decomposition:** Miscellaneous decomposition products.

**Hazardous Polymerization:**            Will Occur            Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:**    Inhalation        Skin            Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Respiratory irritation; eye and/or skin irritation.

### Potential Health Effects (Acute, Chronic, and Delayed)

**Inhalation:** Irritation, cough accompanied by phlegm. Prolonged exposure to mixed cement dusts may cause cough, expectoration, dyspnea, wheezing, pharyngitis, chronic bronchitis, emphysema, cement pneumoconiosis, and silicosis.

**Skin Contact:** Irritation (possibly severe) and dermatitis. Direct contact with wet cement, combined with prolonged contact time and pressure may cause ulcerations and possibly burns. Sensitivity to constituents of cement may induce allergic skin reactions (chromium compounds).

**Eye Contact:** Irritation, visual disturbances, eye damage. In addition, wet cement may cause a burning sensation, corneal edema indicated by seeing halos around lights, and injury to the conjunctiva.

**Ingestion:** Irritation (long-term) and possible gastroduodenal ulcers.

### Numerical Measures of Toxicity

**Acute Toxicity:** Not classified.

Portland cement: No data available.

Silica, crystalline quartz: Rat, Oral LD50: 500 mg/kg



## State Regulations

California Proposition 65: Warning! This product contains a chemical (quartz) known to the state of California to cause cancer.

**U.S. TSCA Inventory:** Portland cement and silica, crystalline quartz are listed.

**TSCA 12(b), Export Notification:** Not listed.

**Canadian Regulations:** WHMIS Information is not provided for this material.

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## 16. OTHER INFORMATION

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**Issue Date:** 21 August 2014

**Sources:** ChemADVISOR, Inc., SDS *Portland Cement*, 19 June 2014.

United States Department of Labor Occupational Safety and Health Administration, *Preventing Skin Problems from Working with Portland Cement*, available at <https://www.osha.gov/dsg/guidance/cement-guidance.html> (accessed Aug 2014).

### Key of Acronyms:

|        |   |       |  |
|--------|---|-------|--|
| ACGIH  | American Conference of Governmental Industrial Hygienists             | OSHA  | Occupational Safety and Health Administration    |
| CAS    | Chemical Abstracts Service  | PEL   | Permissible Exposure Limit                       |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act | RCRA  | Resource Conservation and Recovery Act           |
| CFR    | Code of Federal Regulations   | REL   | Recommended Exposure Limit                       |
| DOT    | Department of Transportation  | RQ    | Reportable Quantity                              |
| EINECS | European Inventory of Existing Commercial Chemical Substances         | RTECS | Registry of Toxic Effects of Chemical Substances |
| EPCRA  | Emergency Planning and Community Right-to-Know Act                    | SARA  | Superfund Amendments and Reauthorization Act     |
| IARC   | International Agency for Research on Cancer                           | SCBA  | Self-Contained Breathing Apparatus               |
| IATA   | International Air Transportation Agency                               | SRM   | Standard Reference Material                      |
| IDLH   | Immediately Dangerous to Life and Health                              | STEL  | Short Term Exposure Limit                        |
| LC50   | Lethal Concentration  | STOT  | Specific Target Organ Toxicity                   |
| LD50   | Median Lethal Dose or Lethal Dose, 50 %                               | TCLo  | Lowest Toxic Concentration                       |
| LEL    | Lower Explosive Limit   | TLV   | Threshold Limit Value                            |
| MSDS   | Material Safety Data Sheet  | TPQ   | Threshold Planning Quantity                      |
| NFPA   | National Fire Protection Association                                  | TSCA  | Toxic Substances Control Act                     |
| NIOSH  | National Institute for Occupational Safety and Health                 | TWA   | Time Weighted Average                            |
| NIST   | National Institute of Standards and Technology                        | UEL   | Upper Explosive Limit                            |
| n.o.s. | Not Otherwise Specified   | WHMIS | Workplace Hazardous Materials Information System |
| NTP    | National Toxicology Program   |       |  |

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srmmsds@nist.gov](mailto:srmmsds@nist.gov); or via the Internet at <http://www.nist.gov/srm>.