

U.S. Department of Labor

Occupational Safety and Health Administration

Hazard Communication Standard

29 CFR 1910.1200.

Safety Data Sheets (SDS)

Section 1: Identification

This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the spoiler.

- A. Portland and Blended Cements.
- B. Silvi Concrete of Montgomery County – 17 Penn Rd., Pottstown, PA 19464
[REDACTED]
- 2. Emergency Phone No. – 215-295-0777
- C. Cement is used as the main ingredient in manufactured concrete. The concrete is poured in a formed surrounding (for structures such as bridges, foundations, structural members, sidewalks, etc.) and stiffens within 2 to 8 hours after pouring and no longer is a hazardous material.

Section 2: Hazard(s) Identification

This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards.

- A. Cement Dermatitis
- B. Irritation of the skin and burning sensation particularly when exposure is in an area of the skin previously subject to abrasion or irritation. Signs and symptoms of dermatitis can include itching, redness, swelling, blisters, scaling, and other changes in the normal condition of the skin (OSHA.)
- C. Hazard statements:
 - a. Acute – wet plastic, unhardened concrete, can dry the skin and cause alkali burns
 - b. Chronic – hypersensitive individuals may develop and allergic dermatitis. Cement may contain trace amounts of chromium
- D. Pictogram – N/A
- E. Precautions to be taken in handling and storing: Use barrier creams, gloves, boots, and clothing to protect skin from prolonged contact with plastic concrete. Particularly avoid abrasion of the skin in contact with unhardened plastic concrete. Precautions must be observed because cement burns occur with little warning – like heat sensitive. Eye protection is not generally required except when placing, loading or testing methods cause splash, then tight fitting goggles should be used.
- F. 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. 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 (OSHA.)

Section 3: Composition/Information on Ingredients

This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed.

Substances

- A. Portland Cement / Blended Cements
- B. Pozzolan
- C. Chemical Abstracts Service (CAS)
 - a. Portland Cement / CAS #65997-15-1 :

Ingredient name	Percentage (Approx.)*	CAS number
Silicon dioxide (SiO ₂)	15 - 25	14808-60-7
Aluminum oxide (Al ₂ O ₃)	4 - 8	1344-28-1
Iron oxide (Fe ₂ O ₃)	1 - 5	1309-37-1
Sulfur trioxide (SO ₃)	1 - 5	7446-11-9
Calcium oxide (CaO)	55 - 65	1305-78-8
Magnesium oxide (MgO)	1 - 5	1309-48-4
Sodium oxide (Na ₂ O)	Trace	1313-59-3
Potassium oxide (K ₂ O)	<0.6	12136-45-7
Titanium oxide (TiO ₂)	Trace	13463-67-7
Phosphorus pentoxide (P ₂ O ₅)	Trace	1314-56-3
Manganic oxide (Mn ₂ O ₃)	Trace	1344-43-0
Strontium oxide (SrO)	Trace	1314-11-0
Chromic oxide (Cr ₂ O ₃)	Trace	1308-38-9
Zinc oxide (ZnO)	Trace	1314-13-2

*concentrations shown in range percentage are to protect trade secrets or due to process variations

Mixtures

- A. Concrete Aggregates, Inert Gravel, Sand, Rocks and admixtures. Some mixtures may include pozzolan (granulated slag and/or fly ash;) which have similar properties as portland cement. Additionally very small amounts of organic and inorganic materials which have no effect on the hazard assoc. with the use of this product.
- B. Fly ash and slag are ingredients that have similar properties as portland cement.
 - a. Fly Ash / CAS #68131-74-8:

Ingredient name	Percentage (Approx.)	CAS number
Silicon dioxide (SiO ₂)	47	14808-60-7
Aluminum oxide (Al ₂ O ₃)	23	1344-28-1

Iron oxide (Fe ₂ O ₃)	17	1309-37-1
Sulfur trioxide (SO ₃)	1	7446-11-9
Calcium oxide (CaO)	4	1305-78-8
Sodium oxide (Na ₂ O)	Trace	1313-59-3
Potassium oxide (K ₂ O)	Trace	12136-45-7

b. Granulated blast furnace slag (GGBFS) / CAS #65996-69-2:

Ingredient name	Percentage (Approx.)	CAS number
Calcium oxide (CaO)	30 - 40	1305-78-8
Magnesium oxide (MgO)	8 – 15	1309-48-4
Quartz	<0.4	14808-60-7
Hexavalent chromium (Cr(VI))	Trace	18450-29-9

c. Fly ash and slag concentrations are from manufacturers SDS sheets, and are in ranges to protect confidentiality.

C. None of the other ingredients added to the mixture are classified as health hazards

D. There is a batch-to-batch variation with the percentages of each ingredient.

Definitions

A. Trace is defined as a percentage of a chemical constituent not always analytically determinable because of miniscule amount.

Section 4: First-Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical.

- A. Irrigate eyes with water. Wash exposed areas of the body with soap and water.
- B. Generally aggravated by exposure.
- C. If irritation continues or burn(s) appear, consult immediate medical attention, when necessary.

Section 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical.

- A. Fire extinguishers are present throughout all our plants and are up to code with local fire depts.
- B. Cement is not a combusting material and does not have any concerns in regards to fires.

Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard.

- A. Spill does not increase hazard.
- B. Material can be retained until it is hardened, when it can be disposed of as common waste.

Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of chemicals.

- A. Good hygiene practices are encouraged within the work environment. Hands and face are to be washed and dried after latrine usage, after working with concrete, and before eating. Even though cement is not combustible, smoking is not allowed on work property.
- B. Cement is stored in a sealed silo, protected from the elements.
- C. OSHA has established a permissible exposure limit to address the inhalation hazards of working with dry portland cement. Employers must limit airborne exposure to portland cement to 15 milligrams per cubic meter (mg/m^3) of air for total dust and 5 mg/m^3 for respirable dust. Because the Cr(VI) content in portland cement is so low, it is anticipated that by meeting the permissible exposure limit (PEL) of 15 mg/m^3 for portland cement, employers will also meet the Cr(VI) PEL and action level of 5 and 2.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) respectively (see 1926.1126) (OSHA.)

Section 8: Exposure Controls/Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure. The best way to prevent cement-related skin problems is to minimize skin contact with wet portland cement.

- A. When employees are working with concrete in enclosed areas, i.e. the central mixer; the proper Personal Protective Equipment (PPE) shall be utilized:
 - a. Respiratory mask
 - b. Gloves
 - c. Goggles
 - d. Clothing to cover extremities
- B. OSHA's personal protective equipment (PPE) standards require that PPE be provided, used, and maintained in a sanitary and reliable condition whenever it is necessary to protect employees from injury or impairment. The employer must provide PPE such

as boots and gloves as necessary and appropriate for jobs involving exposure to portland cement and ensure these items are maintained in a sanitary and reliable condition when not in use. Employees must be able to clean or exchange PPE if it becomes ineffective or contaminated on the inside with portland cement while in use. In addition, employers are required to provide PPE at no cost to their employees with limited exceptions (1910.132(h)) (OSHA.)

a. Table:

Steps for safe glove removal:

1. Wash off the outside of your gloves while you are still wearing them.
2. Loosen gloves on both hands, holding your arms down to prevent water from dripping onto the skin.
3. Holding your arms downward, pull the first glove down to remove **only the glove fingers**. The cuff should still be covering the palm of your hand.
4. Remove the second glove by grabbing it with the first glove.
5. Slip off the first glove.
6. Handle used gloves **by the inside only**.

Source: "Save Your Skin," CPWR, 2000b.

C. Construction employers must make washing facilities available for employees exposed to portland cement. Washing facilities must provide clean water, non-alkaline soap, and clean towels. Such facilities must be readily accessible to exposed employees and adequate for the number of employees exposed. The sanitation requirements for general industry and shipyards are similar to those for construction (OSHA.)

Section 9: Physical and Chemical Properties

This section identifies physical and chemical properties associated with the substance of mixture.

Appearance – Gray, plastic, flowable, granular mud	Upper/lower flammability or explosive limits – N/A
Odor – Odorless	Vapor pressure – N/A
Odor threshold – N/A	Vapor density – N/A
pH – N/A	Relative density – 3.15
Melting point/freezing point – N/A	Solubility(ies) – slight (0.01 to 1%)
Initial boiling point and boiling range – N/A	Partition coefficient: n-octanol/water – N/A
Flash point – N/A	Auto-ignition temperature – N/A

Evaporation rate – N/A	Decomposition temperature – N/A
Flammability (solid, gas) – N/A	Viscosity – N/A

Section 10: Stability and Reactivity

This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other.

Reactivity

- A. Wet portland cement can cause caustic burns, 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(OSHA.)

Chemical stability

- A. Stable under normal ambient temperature while in storage and being handled.
- B. Material does not require any form of stabilizers to maintain chemical stability.
- C. The physical appearance of the concrete shall stiffen over a range in time of 2 to 8 hours, and the level of safety lowers; as concrete becomes non-hazardous as it becomes harden.

Other

- A. Concrete is designed to stiffen and harden over a short period of time. This chemical reaction, called hydration, is not a hazardous reaction. Contrary, as it stiffens, the concrete becomes less and less hazardous; and becomes a non-hazardous material when it fully hardens.
- B. There are no conditions that need to be avoided.
- C. There are no incompatible materials that would react to cement and produce a hazardous situation.
- D. There are no known or anticipated decomposition products that would be produced because of use, storage, or heating.

Section 11: Toxicological Information

This section identifies toxicological and health effects information or indicates that such data are not available.

- A. Contact with wet portland cement 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, Cr(VI) can cause an allergic form of dermatitis (allergic contact dermatitis, or ACD) in *sensitized* employees who work with wet portland cement. 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 (OSHA.)

- B. 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) (OSHA.)
- C. Signs and symptoms of dermatitis can include itching, redness, swelling, blisters, scaling, and other changes in the normal condition of the skin (OSHA.)
- D. Employees who work with wet portland cement 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 (OSHA.)
- E. Cement has not been found to be a potential carcinogen by OSHA.

Section 16: Other Information

This SDS was collaborated in December 2015, by Shaun R Fishburn, [REDACTED] [REDACTED] utilizing the June 1, 2015 Hazard Communication Standard (HCS.) The SDS was updated from OSHA's previous MSDS version (OSHA 174, Sept. 1985.)

Resource: OSHA website- <https://www.osha.gov/dsg/guidance/cement-guidance.html>

Section 12 thru 15 are non-mandatory and have been omitted from this SDS.