

MATERIAL SAFETY DATA SHEET
for
CONCRETE/CONCRETE PRODUCTS
(wet unhardened concrete and dry hardened concrete products
such as block, pipe, and precast concrete)

Section I - Product and Company Identification

Material Identity or Trade Name: Concrete and Concrete Products
Manufacturer's Name: High Grade Materials Company
Address: 9266 Snows Lake Rd, Greenville MI 48838
Telephone: (616) 754-5545

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Chemical Identity/Common Names)	CAS No.	OSHA PEL	ACGIH TLV	MSHA PEL	%
Portland Cement	65997-15-1	15 mg/m ³ (Total) 5 mg/m ³ (Respirable)	10 mg/m ³	10 mg/m ³ (Total)	10-30%
Limestone (calcium carbonate - CaCO ₃)	1317-65-3	15 mg/m ³ (Total) 5 mg/m ³ (Respirable)	10 mg/m ³	10 mg/m ³ (Total)	25-65%
Crystalline Silica (Quartz) (Concrete contains aggregate materials which may contain crystalline silica)	14808-60-7	30/(%SiO ₂ +2)mg/m ³ (Total) 10/(%SiO ₂ +2) mg/m ³ (Respirable)	0.05 mg/m ³ (Respirable quartz)	30/(%SiO ₂ +3) mg/m ³ (Total) 10/(%SiO ₂ +2) mg/m ³ (Respirable)	0.5-80%
Particulates not otherwise classified	-----	15 mg/m ³ (Total) 5 mg/m ³ (Respirable)	10 mg/m ³ (Inhalable) 3 mg/m ³ (Respirable)	10 mg/m ³ (Total)	0-100%
Fly Ash which contains:	68131-74-8	N/A	N/A	N/A	1-4%
Aluminum Oxide (Al ₂ O ₃)	1344-28-1	15mg/m ³ (Total) 5 mg/m ³ (Respirable)	10 mg/m ³	10 mg/m ³	0.1-2%
Amorphous Silica	61790-53-2	80 mg/m ³ /(%SiO ₂)	10 mg/m ³ (Inhalable) 3 mg/m ³ (Respirable)	20 mppcf	0.01-3%
Calcium Oxide (CaO)	1305-78-8	5 mg/m ³	2 mg/m ³	5 mg/m ³	0-1%
Iron Oxide (Fe ₂ O ₃)	1309-37-1	10 mg/m ³ (as Fe ₂ O ₃)	5 mg/m ³ (as Fe)	10 mg/m ³ (as Fe ₂ O ₃)	0.01-2%

Section II - Hazardous Ingredients/Identity Information (continued)

Slag which contains:	N/A	N/A	N/A	N/A	3-21%
Aluminum Oxide (Al ₂ O ₃)	1344-28-1	15mg/m ³ (Total) 5 mg/m ³ (Respirable)	10 mg/m ³	10 mg/m ³	0-4%
Calcium Oxide (CaO)	1305-78-8	5 mg/m ³	2 mg/m ³	5 mg/m ³	1-11%
Amorphous Silica, hydrated	61790-53-2	80 mg/m ³ / (%SiO ₂)	10 mg/m ³ (Inhalable) 3 mg/m ³ (Respirable)	20 mppcf	1-11%
Crystalline Silica (Quartz)	14808-60-7	30/(%SiO ₂ +2)mg/m ³ (Total) 10/(%SiO ₂ +2) mg/m ³ (Respirable)	0.05 mg/m ³ (Respirable quartz)	30/(%SiO ₂ +3) mg/m ³ (Total) 10/(%SiO ₂ +2) mg/m ³ (Respirable)	0-3%
Magnesium oxide	1309-48-4	15mg/m ³	10 mg/m ³	10 mg/m ³	0-4%
Iron Oxide (Fe ₂ O ₃)	1309-37-1	10 mg/m ³ (as Fe ₂ O ₃)	5 mg/m ³ (as Fe)	10 mg/m ³ (as Fe ₂ O ₃)	0- 2%
Particulates not otherwise classified	N/A	15 mg/m ³ (Total) 5 mg/m ³ (Respirable)	10 mg/m ³ (Inhalable) 3 mg/m ³ (Respirable)	10 mg/m ³ (Total)	0-1%
Magnesium oxide	7439-96-5	(C) 5mg/m ³ (as Mn)	0.2 mg/m ³ (as Mn)	5 mg/m ³ (as Mn)	0-0.5%
Sulfur	7704-34-9	N/A	N/A	N/A	<1%

Note: Chemical admixtures may be present in quantities less than 1%. MSDSs for admixtures are available upon request.

Section III - Physical/Chemical Characteristics

Boiling Point	Not Applicable	Specific Gravity (H₂O = 1)	Wet concrete 1.9 to 2.4
Vapor Pressure (mm Hg)	Not Applicable	Melting Point	Not Applicable
Vapor Density (Air = 1)	Not Applicable	Evaporation Rate (Butyl Acetate = 1)	Not Applicable

Solubility in Water: Not soluble

Appearance and Odor: Hardened concrete products are odorless solid materials. Unhardened wet concrete is an odorless gray, plastic, flowable, granular mud of varying color and texture.

Section IV - Fire and Explosion Hazard Data

Flash Point: Not Combustible	Flammable Limits: Not Flammable	LEL: N/A	UEL: N/A
-------------------------------------	--	-----------------	-----------------

Extinguishing Media: This material is noncombustible. Use extinguishing media appropriate to surrounding fire.

Special Fire Fighting Procedures: Do not expose skin or eyes to wet unhardened concrete. Be aware of runoff from fire control methods. Do not release wet unhardened concrete to sewers or waterways, as it will harden and obstruct sewers and waterways.

Unusual Fire and Explosion Hazards: None Reported

Section V - Reactivity Data

Stability: Wet unhardened concrete sets and hardens in 2 to 8 hours and is no longer hazardous. Hardened concrete is stable.	Unstable		Conditions to Avoid: Do not allow wet unhardened concrete to set on skin, tools, or surfaces. Product hardens in 2-8 hours
	Stable	X	

Incompatibility (Materials to Avoid): Stable under expected conditions of use. Under unanticipated conditions of use, crystalline silica may react with hydrofluoric acid to produce a corrosive gas (silicon tetrafluoride). Aluminum powder and other alkali and alkaline earth metals will react in wet mortar or concrete, liberating hydrogen gas.

Hazardous Decomposition or Byproducts: Thermal oxidative decomposition of CaCO₃ (limestone) can produce lime (CaO). The lime does not add to the hazards associated with the use of the product.

Hazardous Polymerization: Will not occur.

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation? Yes	Skin? No	Ingestion? Unlikely
---------------------------	------------------------	-----------------	----------------------------

Health Hazards :

Acute Effects: Skin contact with wet concrete can dry the skin and cause alkali burns. Within 12 to 48 hours after skin contact (after one to six-hour exposures), first, second or third degree burns may occur. There may be no obvious pain at the time of exposure. Eye contact with wet unhardened concrete may cause burning and possible corneal edema. Ingestion of concrete dust may cause esophagus and stomach burns.

Cutting, grinding, crushing, or drilling hardened concrete or concrete products may generate dust containing crystalline silica. Acute effects of exposure to such dust may include:

EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion.

SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion.

SKIN ABSORPTION: Not expected to be a significant route of exposure.

INGESTION: Expected to be practically non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage.

INHALATION: Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion. Coughing, sneezing, and shortness of breath may occur following exposures in excess of recommended exposure limits.

Use of concrete products for construction purposes is not believed to cause additional acute toxic effects. However, repeated overexposures to very high levels of respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as six months have caused acute silicosis. Acute silicosis is a rapidly progressive, incurable lung disease that is typically fatal. Symptoms include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain.

Chronic Effects: Continued exposure of the skin to wet unhardened concrete may cause chronic dermatitis.

Chronic bronchitis may result from chronic exposure to dust generated from cutting, grinding, crushing, or drilling hardened concrete. Chronic exposure to respirable limestone dust in excess of the ACGIH TLV has caused pneumoconiosis (Dusty Lung). Concrete dust may contain more than 0.1% crystalline silica, which is a cancer hazard if inhaled. Cancer risk depends on duration and level of exposure. Prolonged exposure to crystalline silica can cause silicosis, a progressive pneumoconiosis (lung disease). Respirable dust containing newly broken silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken particles of silica.

Section VI - Health Hazard Data (continued)

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a causal relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate an increased risk in developing lung cancer, a risk that increases with duration of exposure. Many of these studies of silicotics do not account for lung cancer confounders, especially smoking.

Carcinogenicity: Concrete products are not listed on the NTP, IARC, or OSHA list of carcinogens. However, in October 1996, IARC classified respirable crystalline silica from occupational sources as carcinogenic (Group 1). The NTP indicates that crystalline silica (respirable size) is a known human carcinogen (Group 1). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica. Iron oxide is listed by IARC as exhibiting evidence of carcinogenicity in experimental animals.

Signs and Symptoms of Exposure:

Freshly mixed concrete is irritating to the eyes and skin. Wet concrete can dry the skin and can cause alkaline burns to the skin and eyes. Hypersensitive individuals may develop an allergic dermatitis.

Chronic exposure to respirable dust containing crystalline silica in excess of applicable OSHA PELs, MSHA PELs, and ACGIH TLVs has caused silicosis, a progressive lung disease. Chronic tobacco smoking may further increase the risk of developing chronic lung problems. Not all individuals with silicosis will exhibit symptoms (signs) of the disease. However, silicosis is progressive, and symptoms can appear at any time, even years after exposures have ceased. Symptoms of silicosis may include (but are not limited to): shortness of breath, difficulty breathing with or without exertion, coughing, diminished work capacity, diminished chest expansion, reduction of lung volume, right heart enlargement and/or failure. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Medical Conditions Generally Aggravated by Exposure:

Individuals with chronic respiratory disorders should minimize inhalation of dust generated from cutting, grinding, crushing, or drilling hardened concrete. Individuals with skin diseases should minimize skin contact with the dust, and with wet unhardened concrete.

Physicians Note: Ingestion of large amounts of wet unhardened concrete is unlikely. However, if wet concrete is swallowed, to prevent re-exposing the esophagus and stomach, do not induce emesis or perform gastric lavage. Immediate dilution may prevent esophageal burns. For severe burns, consider esophagoscopy within the first 24 hours. Neutralization with acidic agents is not advised because of increased risk of exothermic burns. Water-mineral oil soaks or washing with soap and water may aid in removing hardened concrete from the skin.

Emergency and First Aid Procedures:

Wet unhardened concrete or hardened concrete dust in eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water for a minimum of 15 minutes. Consult a physician immediately if irritation persists or later develops.

Wet unhardened concrete on skin: Quickly remove contaminated clothing. Wash affected areas thoroughly with soap and water. Consult a physician immediately if irritation persists.

Inhalation of hardened concrete dust: Remove exposed person to fresh air and support breathing as needed. Encourage victim to cough, spit out, and blow nose to remove dust. Consult a physician immediately if irritation persists or later develops.

Ingestion of wet unhardened concrete or concrete dust: Never give anything by mouth to an unconscious or convulsing person. Consult a physician immediately. See physician's note in Section VI.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: Personnel involved with the handling of wet unhardened concrete should take steps to avoid contact with the eyes and skin, through the use of gloves and suitable clothing. Wet unhardened concrete should be recycled or allowed to harden and disposed.

Waste Disposal Method: Allow wet unhardened concrete to harden and dispose in a landfill as common solid waste. Follow applicable Federal, State, and local regulations for disposal. The material is not listed as a hazardous waste under designations by the EPA or DOT.

Section VII - Precautions for Safe Handling and Use (continued)

Precautions to Be Taken in Handling and Storing: Silica-containing respirable dust particles may be generated by crushing, cutting, grinding, or drilling hardened concrete or concrete products. Follow protective controls defined in Section VIII when handling these products.

Section VIII - Control Measures

Respiratory Protection: When exposed to dust from cutting, grinding, crushing, or drilling hardened concrete or concrete products above recommended limits, wear a suitable NIOSH-approved respirator with a protection factor appropriate for the level of exposure. Seek guidance from a qualified industrial hygienist, safety professional, or other suitably knowledgeable individual prior to respirator selection and use. For emergency or nonroutine operations (e.g., confined spaces), additional precautions or equipment may be required. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements.

Ventilation	Local Exhaust: When cutting, grinding, crushing, or drilling hardened concrete, provide general or local ventilation systems, as needed, to maintain airborne dust concentrations below the OSHA PELs, MSHA PELs, and ACGIH TLV. Local exhaust ventilation is preferred since it prevents release of contaminants into the work area by controlling it at the source.	Other: Respirable dust and quartz levels from hardened concrete cutting, grinding, crushing or drilling operations should be monitored regularly. Dust and quartz levels in excess of applicable OSHA PELs, MSHA PELs, and ACGIH TLVs should be reduced by all feasible engineering controls including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations.
	Mechanical (General): See above recommendations.	Special: None reported
Protective Gloves: When handling wet unhardened concrete, wear impervious gloves to prevent skin contact. Wash thoroughly after handling.		Eye Protection: When cutting, grinding, crushing, or drilling hardened concrete, wear safety glasses with side shields or dust goggles in dusty environments. When there is a splash hazard working with wet unhardened concrete, wear safety glasses with side shields or goggles.
Other Protective Clothing or Equipment: Wear suitable protective clothing, as needed, to prevent skin contact with wet unhardened concrete. Make available (if necessary) the use of eyewash stations and suitable washing facilities.		

Work/Hygienic Practices: Avoid dust inhalation and direct contact with skin and eyes. Wear gloves, boots, and other protective gear when pouring concrete. If respiratory protection is used, institute a respiratory protection program that includes regular training, inspection, maintenance, and evaluation. To prevent ingestion and skin contact, practice good personal hygiene. Wash contaminated skin before eating, drinking, smoking, lavatory use and before applying cosmetics.

DISCLAIMER:

The information contained in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data that the Company believes to be accurate. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside the Company's control, the Company makes no warranties, expressed or implied, and assumes no liability in connection with any use of this information.