



# MATERIAL SAFETY DATA SHEET

## For CONCRETE

(Wet unhardened concrete and dry hardened concrete)

Section I-Product and Company Identification	
<b>Material Identity (Trade Names): Concrete/Concrete Products</b>	
Manufacturer's Name: Bedford Ready Mix Concrete Company Inc.	Emergency Telephone Number: 434-846-6563
Address: 802 Railroad Avenue	Telephone Number for Information: 434-846-6563
Bedford, Virginia 24523	Revised 04/03/2009

Section II-Hazardous Ingredients/Identity Information					
Hazardous Components (Chemical Identity/Common Names)	CASE No.	OSHA PEL	ACGIH TLV	MSHA PEL	%
Portland Cement	65997-15-1 (Total) 5mg/m <sup>3</sup> (Respirable)	15mg/m <sup>3</sup> (Total)	10mg/m <sup>3</sup> (Total)	10mg/m <sup>3</sup> (Total)	10-30%
Limestone (CaCO <sub>3</sub> ) (Calcium carbonate, present, if limestone aggregates are used)	1317-65-3 (Total)	15mg/m <sup>3</sup> (Total)	10 mg/m <sup>3</sup> (Total)	10mg/m <sup>3</sup>	0-65%
Crystalline Silica (Quartz) (Concrete aggregates may contain silica)	14808-60-7	30 (%SiO <sub>2</sub> +2)mg/m <sup>3</sup> (Total particulate) 10/(%SiO <sub>2</sub> +2)mg/m <sup>3</sup> (Respirable particulate)	0.1mg/m <sup>3</sup> (Total) (Respirable quartz)	30 (%SiO <sub>2</sub> +2)mg/m <sup>3</sup> (Total) 10/(%SiO <sub>2</sub> +2)mg/m <sup>3</sup> (Respirable)	0.5-80%
Particulates not otherwise Classified		15 mg/m <sup>3</sup> (Total) 5mg/m <sup>3</sup> (Respirable)	10mg/m <sup>3</sup> (Inhalable)  3mg/m <sup>3</sup> (Respirable)	10mg/m <sup>3</sup> (Total)	0-100%
Fly Ash which contains:	68131-74-8	N/A	N/A	N/A	1-4%
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )	1344-28-1	15mg/m <sup>3</sup> (Total) 5mg/m <sup>3</sup> (Respirable)	10mg/m <sup>3</sup>	10mg/m <sup>3</sup>	0.1-2%
Amorphous Silica	61790-53-2	80mg/m <sup>3</sup> /(%SiO <sub>2</sub> )	10mg/m <sup>3</sup> (Total)  3mg/m <sup>3</sup> (Respirable)	20mppcf	0.01-3%
Calcium Oxide (CaO)	1305-78-8	5mg/m <sup>3</sup>	2mg/m <sup>3</sup>	5mg/m <sup>3</sup>	0-1%
Iron Oxide (as Fe <sub>2</sub> O <sub>3</sub> )	1309-37-1	10mg/m <sup>3</sup>	10mg/m <sup>3</sup>	10mg/m <sup>3</sup>	0.1-2%
Note: Chemical admixtures may be present in quantities less than 1%.					

### Section III-Physical/Chemical Characteristics

<b>Boiling Point</b>	Not Applicable	<b>Specific Gravity (H<sub>2</sub>O=1)</b>	Wet Concrete 1.9 to 2.4
<b>Vapor Pressure (mm Hg)</b>	Not Applicable	<b>Melting Point</b>	Not Applicable
<b>Vapor Density (Air = 1)</b>	Not Applicable	<b>Evaporation Rate (Butyl Acetate = 1)</b>	Not Applicable
<b>Solubility in Water:</b> not soluble			
<b>Appearance and Odor:</b> 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

<b>Flash Point:</b> Not Combustible	<b>Flammable Limits:</b> Not flammable	<b>LEL:</b> N/A	<b>UEL:</b> N/A
<b>Extinguishing Media:</b> This material is noncombustible. Use extinguishing media appropriate to surrounding fire.			
<b>Unusual Fire and Explosion Hazards:</b> None reported.			

### Section V-Reactivity Data

<b>Stability:</b> Wet unhardened concrete sets and hardens in 2-8 hours and is no longer hazardous.
<b>Hardened concrete is stable. Conditions to avoid:</b> Do not allow wet unhardened concrete to harden on tools or surfaces. Product hardens in 2-8 hrs.
<b>Incompatibility (Materials to avoid):</b> 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.
<b>Hazardous Decomposition or Byproducts:</b> Thermal oxidative decomposition of CaCO <sub>3</sub> (limestone) can produce lime (CaO). The lime does not add to the hazards associated with the use of the product. <b>Note: Hazardous Polymerization will not occur.</b>

### Section VI-Health Hazard Data

<b>Route(s) of Entry:</b>	<b>Inhalation?</b> Yes	<b>Skin?</b> No	<b>Ingestion?</b> Unlikely
<b>Health Hazards:</b> 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:  <b>EYE CONTACT:</b> Direct contact with dust may cause irritation by mechanical abrasion.  <b>SKIN CONTACT:</b> Direct contact may cause irritation by mechanical abrasion.  <b>SKIN ABSORPTION:</b> Not expected to be a significant route of exposure.  <b>INGESTION:</b> Expected to be practically non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage.  <b>INHALATION:</b> 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			

## Section VI-Health Hazard Data – (continued)

overexposures to very high levels of 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.

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 silicosis 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 a known human carcinogen (Group 1). The NTP indicates that crystalline silica is reasonably anticipated to be a carcinogen (Group 2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica. Concrete may contain crystalline silica in concentrations greater than 0.1%, principally contributed by the aggregates. Crystalline silica in wet concrete is not respirable and does not pose a hazard when the concrete is in its plastic or unhardened state. Once concrete has hardened, airborne dust generated by grinding, sawing, drilling, breaking, etc. may lead to potentially hazardous exposures to workers and appropriate respiratory protection precautions should be taken.

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. It 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. 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. Washing with a pH neutral soap and water may aid in removing hardened concrete from the skin.

## Section VI-Health Hazard Data – (continued)

### Emergency and First Aid Procedures

**Wet unhardened concrete or hardened concrete dust in the eyes:** Gently lift the eyelids and flush immediately and continuously with flooding amounts of water for a minimum fifteen 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 a pH neutral 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. 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 hazardous waste under designations by the EPA or DOT.

**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 protection factor appropriate for the level of exposure. 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.

### 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 TLVs. 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 chemical resistant 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.

## Section VIII-Control Measures – (continued)

**Other Protective Clothing or Equipment:** Wear suitable protective clothing, as needed, to prevent skin contact with unhardened concrete.

**Work/Hygienic Practices:** Contact with wet unhardened concrete, mortar, cement or cement mixtures can cause skin irritation, severe chemical burns, or serious eye damage. Avoid contact with eyes and skin. Wear waterproof gloves, a fully buttoned long-sleeved shirt, full-length trousers, and tight fitting eye protection when working with these materials. If you have to stand in wet concrete, use waterproof boots that are tight at tops and high enough to keep concrete from flowing into them. If you are finishing concrete, wear knee pads to protect knees. Wash wet concrete, mortar, cement, or cement mixtures from your skin with fresh, clean water immediately after contact. Indirect contact through clothing can be as serious as direct contact, so promptly rinse out wet concrete, mortar, cement or cement mixtures from clothing. Seek immediate medical attention if you have persistent or severe discomfort. In case of eye contact, flush with plenty of water for at least 15 minutes. Consult a physician immediately. **KEEP OUT OF REACH OF CHILDREN** Avoid dust inhalation and direct contact with skin and eyes. Wash contaminated skin before eating, drinking, smoking, lavatory use and before applying cosmetics.