



Product 36% SiC / 5% Mn Slabs **Date Prepared** January 14, 2000

Miller and Company LLC
9700 West Higgins Road
Suite 1000
Rosemont, Illinois 60018

Emergency Telephone Number: 847-696-2677

Other Information Calls: 847-696-2400

The subject product is a mechanical blend of the following ingredients:

<u>Component</u>	<u>% in Mixture</u>
<u>90% SiC Grain</u>	<u>0 – 30 %</u>
<u>SiC Low Grade</u>	<u>0 – 50 %</u>
<u>SiC Mid Grade</u>	<u>0 – 60 %</u>
<u>FeMn Fines</u>	<u>5 – 10 %</u>
<u>Portland Cement</u>	<u>8 – 12%</u>

Custom blended per chemical analysis of specific ingredients inventoried at time of blending so as to meet customer specifications.

Since the mixture presents no greater hazard than any of the individual components, and since the burden of information lies with the primary producer, the data sheets for the individual components are attached and will satisfy the requirements of the standard for a data sheet for the mixture. This interpretation comes from an OSHA field directive to compliance officers, "Appendix A, Clarifications and Interpretations of the Hazard Communication Standard (HCS)," OSHA CPL 2-2.38B, 15 August 1988.

MATERIAL SAFETY DATA SHEET

SECTION 1 : PRODUCT IDENTIFICATION

PRODUCT NAME : Silicon Carbide
TRADE NAME(S) : Silicon Carbide / De Oxo Sil CAS #409-21-2
CHEMICAL FORMULA : SiC
SUPPLIER'S NAME : Miller and Company LLC

ADDRESS : Miller and Company LLC
9700 W. Higgins Road, Suite 1000
Rosemont, IL 60018

EMERGENCY TELEPHONE NO : 800-424-9300 (Chemtrec)
TELEPHONE NO FOR INFORMATION : 847-696-2400
DATE PREPARED : September 10, 1997
REVIEWED AND UPDATED 10-01-03
BY SUDHIR GUPTA – VICE PRESIDENT
PRODUCT/MARKET GROUP

SECTION II : HAZARDOUS INGREDIENTS INFORMATION

PERCENT HAZARDOUS COMPONENTS CAS OSHA PEL* ACGIH TLV

80%-100% Silicon Carbide (409-21-2)	10 MG/M3	10 MG/M3
	(5 MG/M3 Respirable dust fraction)	
< 4% Graphite (Synthetic) (None)	10 MG/M3	10 MG/M3
	(5 MG/M3 Respirable dust fraction)	
< 1% Free Si (7440-21-3)	10 MG/M3	10 MG/M3
	(5 MG/M3 Respirable dust fraction)	
< 7%***Free SiO ₂ (14808-60-7)	0.1 MG/M3	0.1 MG/M3 **

* O.S.H.A. Final PEL limits effective 06/03/93.

** As quartz - To the best of our knowledge the SiO₂ present is in the form of alpha quartz.

*** The percent of respirable dust fraction has not been determined. This should be measured using established industrial hygiene methods.

SECTION III : PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT : Decomposes at 2972 degrees C
Sublimes at 2700 degrees C
VAPOR PRESSURE : NA
VAPOR DENSITY : NA
PH : NA
SPECIFIC GRAVITY (H₂O = 1) : 3.217
MELTING POINT : See Boiling Point
EVAPORATION RATE : NA
SOLUBILITY IN WATER : Insoluble

APPEARANCE AND ODOR : Dull Grey Crystal - No odor

SECTION IV : FIRE AND EXPLOSION HAZARD DATA

FLASH POINT : NA
FLAMMABLE LIMITS : NA
LEL : NA
OEL : NA
EXTINGUISHING MEDIA : NA
SPECIAL FIRE FIGHTING PROCEDURES : NA
UNUSUAL FIRE AND EXPLOSION HAZARDS : None (material is NOT combustible)

SECTION V : REACTIVITY DATA

STABILITY : Stable
CONDITIONS TO AVOID : None
INCOMPATIBILITY : NA
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS : None
HAZARDOUS POLYMERIZATION : Will not occur
CONDITIONS TO AVOID : None

SECTION VI : HEALTH HAZARD DATA

ROUTE(S) OF ENTRY : Inhalation
HEALTH HAZARDS : Physical irritation may lead to extensive fibrosis and progressive lung disease
CARCINOGENICITY:
NPT? No IARC MONOGRAPHS? No OSHA REGULATED? No
SIGNS AND SYMPTOMS OF EXPOSURE : Respiratory Distress coughing and shortness of breath
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE :
Any respiratory condition
EMERGENCY AND FIRST-AID PROCEDURES : Remove from area of dust exposure.
If dust gets in eyes, flush immediately with large quantities of clean cool water.

SECTION VII : PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED :
Sweep, shovel or vacuum material. Avoid excessive exposure to dust.
WASTE DISPOSAL METHOD : May be landfilled in accordance with state, federal and local regulations.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING :
Minimize generation of dust.
OTHER PRECAUTIONS : Particles may be sharp and cause cuts and abrasions to skin and eyes.
Use gloves and security glasses.

SECTION VIII : CONTROL MEASURES

RESPIRATORY PROTECTION : NIDSM approved dust respirator
recommended-required above PEL concentr.
VENTILATION : Local exhaust recommended
PROTECTIVE GLOVES : Recommended
EYE PROTECTION : Recommended
OTHER PROTECTIVE CLOTHING OR EQUIPMENT : None
WORK/HYGIENIC PRACTICES :

SECTION IX : SARA TITLE III REPORTING

To the best of our knowledge this product does not contain any substances requiring reporting on the SARA. Title III. Section 313 list.

MATERIAL SAFETY DATA SHEET

SECTION 1 : PRODUCT IDENTIFICATION

PRODUCT NAME : Silicon Carbide(Low-Grade)
TRADE NAME(S) : CAS #409-21-2
CHEMICAL FORMULA : SiC
SUPPLIER'S NAME : Miller and Company LLC

ADDRESS : Miller and Company LLC
9700 W. Higgins Road, Suite 1000
Rosemont, IL 60018

EMERGENCY TELEPHONE NO : 800-424-9300 (Chemtrec)
TELEPHONE NO FOR INFORMATION : 847-696-2400
DATE PREPARED : September 19, 1994
REVIEWED AND UPDATED 10-01-02
BY SUDHIR GUPTA – VICE PRESIDENT
PRODUCT/MARKET GROUP

SECTION II : HAZARDOUS INGREDIENTS INFORMATION

PERCENT HAZARDOUS COMPONENTS CAS OSHA PEL* ACGIH TLV

10%- 30% Silicon Carbide (409-21-2)	10 MG/M3	10 MG/M3 (5 MG/M3 Respirable dust fraction)
10%- 60% Graphite (Synthetic) (None)	10 MG/M3	10 MG/M3 (5 MG/M3 Respirable dust fraction)
> .01% Free Si (7440-21-3)	10 MG/M3	10 MG/M3 (5 MG/M3 Respirable dust fraction)
> 1% ***Free SiO ₂ (14808-60-7)	0.1 MG/M3	0.1 MG/M3 **
> .2% CaO (1305-78-8)	5 MG/M3	2 MG/M3
> 1% Al ₂ O ₃ (1344-28-1)	10 MG/M3	10 MG/M3

* O.S.H.A. Final PEL limits effective 06/03/93.

** As quartz - To the best of our knowledge the SiO₂ present is in the form of alpha quartz.

*** The percent of respirable dust fraction has not been determined. This should be measured using established industrial hygiene methods.

SECTION VII : PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED :

Sweep, shovel or vacuum material. Avoid excessive exposure to dust.

WASTE DISPOSAL METHOD : May be landfilled in accordance with state,
federal and local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING :

Minimize generation of dust.

OTHER PRECAUTIONS : Particles may be sharp and cause cuts and abrasions
to skin and eyes.

Use gloves and security glasses.

SECTION VIII : CONTROL MEASURES

RESPIRATORY PROTECTION : NIDSM approved dust respirator
recommended-required above PEL concentr.

VENTILATION : Local exhaust recommended

PROTECTIVE GLOVES : Recommended

EYE PROTECTION : Recommended

OTHER PROTECTIVE CLOTHING OR EQUIPMENT : None

WORK/HYGIENIC PRACTICES :

SECTION IX : SARA TITLE III REPORTING

To the best of our knowledge this product does not contain any substances requiring reporting on the SARA. Title III. Section 313 list.

MATERIAL SAFETY DATA SHEET

SECTION 1 : PRODUCT IDENTIFICATION

PRODUCT NAME : Silicon Carbide(Mid-Grade)
TRADE NAME(S) : CAS #409-21-2
CHEMICAL FORMULA : SiC
SUPPLIER'S NAME : Miller and Company LLC

ADDRESS : Miller and Company LLC
9700 W. Higgins Road, Suite 1000
Rosemont, IL 60018

EMERGENCY TELEPHONE NO : 800-424-9300 (Chemtrec)
TELEPHONE NO FOR INFORMATION : 847-696-2400
DATE PREPARED : September 19, 1994
REVIEWED AND UPDATED 10-01-02
BY SUDHIR GUPTA – VICE PRESIDENT
PRODUCT/MARKET GROUP

SECTION II : HAZARDOUS INGREDIENTS INFORMATION

PERCENT HAZARDOUS COMPONENTS CAS OSHA PEL* ACGIH TLV

30%- 70% Silicon Carbide (409-21-2)	10 MG/M3	10 MG/M3 (5 MG/M3 Respirable dust fraction)
10%- 30% Graphite (Synthetic) (None)	10 MG/M3	10 MG/M3 (5 MG/M3 Respirable dust fraction)
> .1% Free Si (7440-21-3)	10 MG/M3	10 MG/M3 (5 MG/M3 Respirable dust fraction)
> 1% ***Free SiO ₂ (14808-60-7)	0.1 MG/M3	0.1 MG/M3 **
> .1% CaO (1305-78-8)	5 MG/M3	2 MG/M3
> 1% Al ₂ O ₃ (1344-28-1)	10 MG/M3	10 MG/M3

* O.S.H.A. Final PEL limits effective 06/03/93.

** As quartz - To the best of our knowledge the SiO₂ present is in the form of alpha quartz.

*** The percent of respirable dust fraction has not been determined. This should be measured using established industrial hygiene methods.

SECTION VII : PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED :

Sweep, shovel or vacuum material. Avoid excessive exposure to dust.

WASTE DISPOSAL METHOD : May be landfilled in accordance with state,
federal and local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING :

Minimize generation of dust.

OTHER PRECAUTIONS : Particles may be sharp and cause cuts and abrasions
to skin and eyes.

Use gloves and security glasses.

SECTION VIII : CONTROL MEASURES

RESPIRATORY PROTECTION : NIDSM approved dust respirator
recommended-required above PEL concentr.

VENTILATION : Local exhaust recommended

PROTECTIVE GLOVES : Recommended

EYE PROTECTION : Recommended

OTHER PROTECTIVE CLOTHING OR EQUIPMENT : None

WORK/HYGIENIC PRACTICES :

SECTION IX : SARA TITLE III REPORTING

To the best of our knowledge this product does not contain any substances requiring reporting on the SARA. Title III. Section 313 list.

MATERIAL SAFETY DATA SHEET

Ferromanganese Alloys

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MSDS No.: EMI-MA1000

Revised: May 10, 2006

Date Printed: October 11, 2006



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: **High Carbon Ferromanganese, Standard Ferromanganese, Medium Carbon Ferromanganese, Low Carbon Ferromanganese**

Product Codes: MA1005, MA1101, MA2000, MA2010, MA2210, MA2211, MA3010, MA9110 and MA9308

MANUFACTURER: Eramet / Comilog
Airport Office Park, Bldg. 4, 333 Rouser Road
Moon Township, PA 15108-2749
U.S. Phone Number: (800) 388-7025

EMERGENCY TELEPHONE NUMBER: CHEMTREC (800) 424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS ¹

	<u>wt. %</u>	<u>CAS Registry #</u>
Manganese	> 78	7439-96-5
Iron	< 20	7439-89-6
Carbon	< 7.5	7440-44-0
Silicon	< 1.5	7440-21-3
Chromium	< 0.5	7440-47-3
Nickel	< 0.5	7440-02-0

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):

	<u>EXPOSURE LIMITS 8 hrs. TWA (mg/m³)</u>	
	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Manganese	5 (ceiling)	0.2
Chromium	0.5	0.5
Nickel	1	1

¹ Elemental analysis of the alloy. The manufacturer can provide a more detailed analysis, including other trace elements.

3. HAZARDS IDENTIFICATION

This product does not represent a significant hazard to health, safety or the environment when handled and stored as advised (see Section 7). Repeated, long term inhalation of ferromanganese alloy dust in excess of exposure limits may cause adverse health effects (see Section 11). Handling of ferromanganese does not represent a health risk when usual safety rules are observed. Flammable and noxious gases may be formed in contact with moisture and/or acids (see Sections 10 and 11). Ferromanganese alloy dust suspended in air may under certain conditions cause dust explosions (see Section 5).

4. FIRST AID MEASURES

INHALATION:

Emergency responders should use the appropriate respiratory protection when moving an affected victim to fresh air. Give artificial respiration if breathing has stopped. Call for prompt medical attention. (See Section 11)

SKIN CONTACT:

Wash skin with water and/or a mild detergent. If irritation develops, seek medical attention.

EYE CONTACT:

Rinse eyes with large amounts of water/saline solution until no particles remain in eye. See a physician on persistent feeling of discomfort or if irritation occurs.

INGESTION: Incidental ingestion of small quantities of airborne material in a dusty atmosphere does not represent a significant acute hazard. If large amounts are swallowed, get prompt medical attention.

5. FIRE FIGHTING MEASURES

COMBUSTIBILITY:

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Revised: May 10, 2006

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Ferromanganese alloy, as packaged, is not combustible. When suspended in air, dust of ferromanganese

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alloy can be ignited, will propagate flame readily, and may generate considerable pressure and/or a mild explosion. Avoid generating sparks or ignition sources in areas of high airborne dust levels or in areas with accumulated dust. The degree of combustibility in air is dependent upon particle size, oxide coating, and quality of dispersion. The hazard increases with particle fineness. Thoroughly clean areas or equipment to be maintained prior to dust disturbing or ignition source generation activities. (See Section 10)

AUTO IGNITION TEMPERATURE (dust layer):

Ferromanganese alloy - 555°F (290°C).

LOWER EXPLOSIVE LEVEL (airborne dust):

Ferromanganese alloy - 130 gr/m³.

COMBUSTION PRODUCTS:

Oxides of constituent elements.

MINIMUM IGNITION ENERGY:

Manganese - 80 millijoules; iron - 100 millijoules.

EXTINGUISHING MEDIA:

Class D fire: Use dry powder, dry sand, or CO₂ to smother fire. Fire may also be isolated and allowed to burn itself out. Do not disturb metal while extinguishing the fire.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL:

Ferromanganese alloy spilled on the land represents minimal hazard. Cleanup personnel should wear appropriate respiratory protective equipment when addressing fine material.

Avoid the use of compressed air to maneuver spills or leaks of fine material. Fine material should be swept up or vacuumed using explosion-proof equipment. Keep dry material and wet material separated. Place recovered material in disposal container. Avoid repackaging wet materials in sealed containers.

WATER SPILL:

Remove spilled product from water body by dipping or other appropriate means. Avoid repackaging wet materials in sealed containers.

7. HANDLING AND STORAGE

HANDLING:

Avoid handling that generates dust build-up. Avoid inhalation of dust (see Section 8). Avoid ignition sources (e.g. welding) in areas with high dust concentrations. Addition of wet product to molten metal may cause explosions (see Section 10).

STORAGE:

Ferromanganese alloy should be stored in a dry location at ambient temperatures. Avoid contact with hydrochloric acid (HCl) and nitric acid (HNO₃).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Provide appropriate ventilation of confined spaces. Use explosion-proof ventilation equipment. See Section 2 for Component Exposure Guidelines.

PERSONAL PROTECTION:

Eye protection, eye flushing facilities and protective gloves are recommended. Ensure adequate ventilation. Wear an appropriate particulate respirator in accordance with 29 CFR 1910.134 or CSA Standard Z94.4-M1982 for dust exposure that may exceed exposure limits. Area and/or personal air monitoring is recommended to determine whether exposures are below permissible limits. If exposure to phosphine and arsine is suspected (see section 10), or if adequate ventilation is not possible, then a self contained breathing apparatus or an air supplied respirator is recommended.

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Ferromanganese Alloys

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OCCUPATIONAL EXPOSURE LIMITS (OSHA and ACGIH):

8-hour TWA (mg/m³)

	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Total inhalable dust	15	10
Respirable dust	5	3
Manganese	5 (ceiling)	0.2
Chromium	0.5	0.5
Nickel	1	1
Phosphine gas (PH ₃)	0.4	0.42
Arsine gas (AsH ₃)	0.2	0.16

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Lump or Granule
Color:	Silvery grey, metallic surface
Odor:	Odorless
Solubility:	Insoluble in Water
Melting Point (°C):	1243°C
Specific Gravity (water = 1):	Approx. 4.5

10. STABILITY AND REACTIVITY

GENERAL:

Ferromanganese alloy is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID:

Avoid generating sparks and other ignition sources (e.g. welding) in areas with high dust concentrations. Ferromanganese alloy particles suspended in air can cause dust explosions. Addition of wet material to molten metal may cause explosions.

MATERIALS TO AVOID:

Avoid contact with water and/or acids.

HAZARDOUS REACTION/DECOMPOSITION PRODUCTS:

Highly flammable hydrogen gas (H₂) and the highly flammable and very toxic gases phosphine and arsine (garlic-like smell), both heavier than air, may be formed if ferromanganese alloy comes in contact with moisture, acids or bases. Contact with acids (pH<7) may result in generation of silane (SiH₄), a spontaneously combustible gas. Wet product will form highly flammable hydrogen gas if added to molten metal, due to decomposition of water.

11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS:

INHALATION:

Finely divided dust may irritate and dehydrate mucous membranes. Phosphine/arsine may be absorbed from dust deposited on mucous membranes. The toxic mechanism for phosphine is not clear. Phosphine irritates exposed mucous membranes, depresses the central nervous system (CNS) and can cause edema of the lungs. Acute, non-fatal poisoning with phosphine gives temporary effects, including but not limited to malaise, vomiting, stomach pains, cough, and difficulty in breathing. Symptomatic treatment: Corticosteroids, prophylactic for edema of the lungs.

SKIN CONTACT:

Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

EYE CONTACT:

Dust may irritate and cause dryness but will not permanently injure eye tissue.

INGESTION:

No hazard in normal industrial use.

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CHRONIC EFFECTS:

Manganese poisoning (Manganism) can occur from excessive intake of manganese via inhalation and ingestion. The most notable effects of manganese poisoning are central nervous system disorders which may occur as early as six months after initial exposure. Symptoms include apathy, drowsiness, sleep disturbance, muscular twitching, spastic gait, and emotion control problems. Permanent injury of the central nervous system may occur if chronic manganese poisoning is not treated.

Prolonged exposure (years) to phosphine may lead to chronic effects such as difficulty in movement and speech problems. Epidemiological studies in the Norwegian ferroalloy industry have neither shown an increased rate of mortality, nor an increased incidence of cancer.

Fumes produced through heating metal to high temperatures may be associated with pneumoconiosis. Ferromanganese alloys are not known to be reproductive toxins, teratogens, or mutagens.

POTENTIAL HEALTH EFFECTS:

This product contains chromium in the metallic state. The International Agency for Research on Cancer has determined that chromium and certain chromium compounds are "casually associated with cancer in humans" but "the compounds responsible for the carcinogenic effect in humans cannot be specified". This requires that chromium in all forms be identified as carcinogenic under OSHA. The American Conference of Governmental Industrial Hygienists has reviewed the available data and concluded that specific water soluble and insoluble hexavalent chromium compounds are carcinogenic to humans.

NIOSH/OSHA "Guide for Chemical Hazards" conclusions are consistent with ACGIH; however, NIOSH recommended that all hexavalent chromium compounds be considered carcinogenic until proven otherwise. No recommendations have been made by ACGIH or NIOSH to include chromium metal or chromous and chromic salts as carcinogenic.

The International Agency for Research on Cancer has determined that nickel and certain nickel compounds are "probably carcinogenic to humans" but the nickel compounds responsible for the effect have not been specified. This requires that nickel in all forms be identified as carcinogenic under OSHA. The American Conference of Governmental Industrial Hygienists has reviewed the available data and concluded that not all forms of nickel are carcinogenic. The American Industrial Hygiene Association has also concluded that there is no epidemiological evidence of increased risk of respiratory cancer in the refining of oxide ores or "in any other specifically nickel occupational exposures".

12. ECOLOGICAL INFORMATION

Ferromanganese alloy is not characterized as a hazard to the environment.

13. DISPOSAL CONSIDERATIONS

Avoid repackaging wet material in sealed containers. Dispose of in accordance with applicable federal, state, and local regulations. Ferromanganese alloy is not a listed RCRA Hazardous Waste (40 CFR 261).

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION):

Proper Shipping Name: Not Regulated

Hazard Class: Not Regulated

I.D. Number and Initials: Not Regulated

Packing Group: Not Regulated

Label(s): Not Regulated

15. REGULATORY INFORMATION

OSHA (Occupational Safety and Health Administration)

Hazardous by definition of hazardous communication standard (29 CFR 1910.1200)

TSCA (Toxic Substance Control Act):

Components of this product are listed on the TSCA Inventory.

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CERCLA (Comprehensive Response Compensation, and Liability Act):

Ferromanganese alloy is not found in "List of Hazardous Substances and Reportable Quantities" (40 CFR 302.4). No RQ has been assigned for the generic or broad class of "Manganese and Compounds".

RCRA (Resource Conservation/Recovery Act):

Ferromanganese alloy is not a listed hazardous waste.

SARA TITLE III (Superfund Amendments and Reauthorization Act):

311/312 Hazard Categories:

Immediate Health, Delayed Health, Fire.

313 Reportable Ingredients:

Manganese (CAS No. 7439-96-5)

Chromium (CAS No. 7440-47-3)

Nickel (CAS No. 7440-02-0)

CALIFORNIA PROPOSITION 65:

This product contains chemical(s) known to the State of California to cause cancer:

Nickel

16. OTHER INFORMATION

Literature references are available upon request from the manufacturer.

The information presented in this Material Safety Data Sheet relates to this specific material. It may not be valid for this material if used in combination with any other materials or in any process. It is the user's responsibility to verify the suitability and completeness of this information for the particular use intended.

Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Portland Cement (cement)

Product Identifiers: Cement, Portland Cement, Hydraulic Cement, Oil Well Cement, Trinity[®] White Cement, Antique White Cement, Portland Cement Type I, IA, IE, II, I/II, IIA, II L.A., III, IIIA, IV, IVA, V, VA, 10, 20, 30, 40, 50, GU, MS, MH, HE, LH, HS, OWH, OWG Cement, OW Class G HSR

Manufacturer:
Lafarge North America Inc.
12950 Worldgate Drive, Suite 500
Herndon, VA 20170

Information Telephone Number:
703-480-3600 (9am to 5pm EST)

Emergency Telephone Number:
1-800-451-8346 (3E Hotline)

Product Use: Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

Note: This MSDS covers many types of Portland cement. Individual composition of hazardous constituents will vary between types of Portland cement.



Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL -TWA (mg/m ³)	ACGIH TLV-TWA (mg/m ³)	LD ₅₀ (mouse, intraperitoneal)	LC ₅₀
Portland Cement*	100	65997-15-1	15 (T); 5 (R)	10 (R)	NA	NA
Calcium Sulfate*	2-10	13397-24-5	15 (T); 5 (R)	10 (T)	NA	NA
Calcium Carbonate*	0-5	1317-65-3	15 (T); 5 (R)	10 (T)	NA	NA
Calcium Oxide	0-5	1305-78-8	5 (T)	2 (T)	3059 mg/kg	NA
Magnesium Oxide	0-4	1309-48-4	15 (T)	10 (T)	NA	NA
Crystalline Silica	0-0.2	14808-60-7	[(10) / (%SiO ₂ +2)] (R); [(30) / (%SiO ₂ +2)] (T)	0.05 (R)	NA	NA

Note: Exposure limits for components noted with an * contain no asbestos and <1% crystalline silica

Cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis. For example, cement may contain trace amounts of calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, nickel compounds, and other trace compounds.

Section 3: HAZARD IDENTIFICATION

	WARNING	
<p>Corrosive - Causes severe burns. Toxic - Harmful by inhalation. (Contains crystalline silica)</p> <p>Use proper engineering controls, work practices, and personal protective equipment to prevent exposure to wet or dry product.</p> <p>Read MSDS for details.</p>		

Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Cement is a solid, grey, off white, or white odorless powder. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard. Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible tissue (skin, eye, respiratory tract) damage due to chemical (caustic) burns, including third degree burns.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet cement can cause moderate eye irritation, chemical burns and blindness. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact: Cement may cause dry skin, discomfort, irritation, severe burns, and dermatitis.

Burns: Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible damage to skin, eye, respiratory and digestive tracts due to chemical (caustic) burns, including third degree burns. A skin exposure may be hazardous even if there is no pain or discomfort.

Dermatitis: Cement is capable of causing dermatitis by irritation and allergy. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling, and cracking.

Irritant dermatitis is caused by the physical properties of cement including alkalinity and abrasion.

Allergic contact dermatitis is caused by sensitization to hexavalent chromium (chromate) present in cement. The reaction can range from a mild rash to severe skin ulcers. Persons already sensitized may react to the first contact with cement. Others may develop allergic dermatitis after years of repeated contact with cement.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Cement is not listed as a carcinogen by IARC or NTP; however, cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Section 3: HAZARD IDENTIFICATION (continued)

Ingestion: Do not ingest cement. Although ingestion of small quantities of cement is not known to be harmful, large quantities can cause chemical burns in the mouth, throat, stomach, and digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) or sensitivity to hexavalent chromium can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis – which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis – occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis – results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method:	Non-combustible	Firefighting Equipment:	Cement poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.
General Hazard:	Avoid breathing dust. Wet cement is caustic.	Combustion Products:	None.
Extinguishing Media:	Use extinguishing media appropriate for surrounding fire.		

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION (continued)

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	Evaporation Rate:	NA.
Appearance:	Gray, off white or white powder.	pH (in water):	12 – 13
Odor:	None.	Boiling Point:	>1000° C
Vapor Pressure:	NA.	Freezing Point:	None, solid.
Vapor Density:	NA.	Viscosity:	None, solid.
Specific Gravity:	3.15	Solubility in Water:	Slightly (0.1 - 1.0%)

Section 10: STABILITY AND REACTIVITY

Stability: Stable. Keep dry until use. Avoid contact with incompatible materials.

Incompatibility: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

Hazardous Polymerization: None.

Hazardous Decomposition: None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION

OSHA/MSHA Hazard Communication: This product is considered by OSHA/MSHA to be a hazardous chemical and should be included in the employer's hazard communication program.

CERCLA/SUPERFUND: This product is not listed as a CERCLA hazardous substance.

EPCRA SARA Title III: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.

EPCRA SARA Section 313: This product contains none of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Section 15: REGULATORY INFORMATION (continued)

- RCRA:** If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.
- TSCA:** Portland cement and crystalline silica are exempt from reporting under the inventory update rule.
- California Proposition 65:** Crystalline silica (airborne particulates of respirable size) and Chromium (hexavalent compounds) are substances known by the State of California to cause cancer.
- WHMIS/DSL:** Products containing crystalline silica and calcium carbonate are classified as D2A, E and are subject to WHMIS requirements.


Section 16: OTHER INFORMATION
Abbreviations:

>	Greater than	NA	Not Applicable
ACGIH	American Conference of Governmental Industrial Hygienists	NFPA	National Fire Protection Association
CAS No	Chemical Abstract Service number	NIOSH	National Institute for Occupational Safety and Health
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NTP	National Toxicology Program
		OSHA	Occupational Safety and Health Administration
CFR	Code for Federal Regulations	PEL	Permissible Exposure Limit
CL	Ceiling Limit	pH	Negative log of hydrogen ion
DOT	U.S. Department of Transportation	PPE	Personal Protective Equipment
EST	Eastern Standard Time	R	Respirable Particulate
HEPA	High-Efficiency Particulate Air	RCRA	Resource Conservation and Recovery Act
HMIS	Hazardous Materials Identification System	SARA	Superfund Amendments and Reauthorization Act
IARC	International Agency for Research on Cancer	T	Total Particulate
		TDG	Transportation of Dangerous Goods
LC ₅₀	Lethal Concentration	TLV	Threshold Limit Value
LD ₅₀	Lethal Dose	TWA	Time Weighted Average (8 hour)
mg/m ³	Milligrams per cubic meter	WHMIS	Workplace Hazardous Materials Information System
MSHA	Mine Safety and Health Administration		

This MSDS (Sections 1-16) was revised on March 3, 2005.

An electronic version of this MSDS is available at: www.lafarge-na.com under the Products section.

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