fac.

SHEFFIELD
POTTERY, INC.
Mining / Raw & Moist Clay / Supplies

MSDS

63-B

STONEWARE CLAY

We do not have an MSDS on the clay itself. Enclosed herewith are the MSDS Sheets on the following Ingredients.

A.P.G. FIRE CLAY
C&C BALL CLAY
EPK
FLINT 200M
KONA F-4 FELDSPAR

U.S. Route 7, P.O. Box 399 - Sheffield, Massachusetts 01257-0399
Phone No. 413-229-7700 or Toll Free 888-SPI-CLAY Fax: 413-229-0200

MATERIAL SAFETY DATA SHEET

Date: 04/18/95

No. 3755

A. P. GREEN INDUSTRIES, INC.
GREEN BOULEVARD, MEXICO, MO 65265
EMERGENCY TELEPHONE NUMBER — 314-473-3626

SECTION I

PRODUCT NAME: DRY MILLED FIRECLAY

PRODUCT TYPE: Raw Fireclay

CHEMICAL FAMILY: SiO_2 = 56% Al_2O_3 = 40% Fe_2O_3 = 1% TiO_2 = 2% K_2O = 1% (calcined basis)

FORMULA: Not Applicable

SECTION II
PRODUCT HAZARDOUS INGREDIENTS

CHEMICAL	TLV-TWA	CAS #
Quartz (SiO_2) (<2%)	0.1 mg/m³* Respirable Dust	14808-60-7

*Source: American Conference of Governmental Industrial Hygienists, 1994-1995.

SECTION III
PHYSICAL DATA

SOLUBILITY IN WATER: Slight

VOLATILES BY VOLUME (%): Nil

SPECIFIC GRAVITY: Not Applicable

MELTING POINT: Not Applicable

APPEARANCE AND ODOR: Gray, granular; no odor

SECTION IV
FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None

EXTINGUISHING MEDIA: Not Combustible

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SECTION V
HEALTH HAZARD DATA

EFFECT OF OVEREXPOSURE:

EYES: ACUTE: Dust can cause mechanical irritation.
CHRONIC: None Known

SKIN:	ACUTE:	None Known
	CHRONIC:	None Known
INHALATION:	ACUTE:	Dust, if present, may cause upper respiratory irritation.
	CHRONIC:	Long-term exposure to dust may cause lung damage.
INGESTION:	ACUTE:	Unknown
	CHRONIC:	Unknown

EYES: Immediately flush with clean water for 15 minutes. If irritation occurs, consult physician.

SKIN: Not Applicable

INHALATION: Remove to fresh air. Seek medical attention.

INGESTION: Contact physician immediately. Do not induce vomiting unless instructed to do so by physician.

SECTION VI
REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY: None Known

HAZARDOUS POLYMERIZATION: Will not occur

SECTION VII
SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep or shovel up.

WASTE DISPOSAL METHOD: May be disposed of in an approved landfill, in accordance with local, state, and federal regulations.

SECTION VIII
SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH approved respirator when working with dry clay or fired clay.

VENTILATION: General mechanical ventilation is adequate.

EYE PROTECTION: Optional

OTHER PROTECTION: None

SECTION IX
SPECIAL PRECAUTIONS

Warning: This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

NIOSH approved respirators should be worn any time that refractories are torn out after service. While some respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

This MSDS provides the toxic chemical "SUPPLIER INFORMATION" required under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372. Toxic chemical information, if applicable to the product(s) named, is located in Section II - HAZARDOUS INGREDIENTS section of the MSDS. This information is subject to the toxic chemical reporting requirements of Section 313 and must be included in all MSDSs that are copied and distributed for this product.

This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Industries, Inc. or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Title: Senior Technical Consultant
Phone: (314) 473-3392

SPINKS CLAY COMPANY, INC.

P.O. BOX 820
PARIS, TN 38242
ph. (901) 642-5414 fax (901) 642-5493

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

PRODUCT: Ball Clay (CAS# 1332-58-7) EMERGENCY TELEPHONE NUMBER: (901) 642-5414
TRADE NAME: Various*
CHEMICAL NAME: Hydrous Aluminum Silicate
CHEMICAL FAMILY: Kaolinite
FORMULA: Al_2O_3-2Slo_2-2H_2O+impurities. DATE REVISED: June, 1996

* The information contained in this MSDS is applicable to all of Spinks' non-slurry ball clay product line

II. HAZARDOUS INGREDIENTS

COMPONENT	CAS#	PERCENT	ACGIH-TLV	OSHA-PEL
Crystallin Silica(Quartz)	14808-60-7	5-30%	0.1 mg/m^3 (respirable)	0.1mg/m^3 (respirable)
Respirable Particulate(clay dust)			3.0 mg/m^3	5.0 mg/m^3

The exposure limits are based on a TWA for an eight (8) hour shift/ 40 hour week.

III. HEALTH HAZARD DATA

ROUTES OF ENTRY	HEALTH EFFECTS
EYES :	Contact may cause irritation and temporary discomfort.
INHALATION:	Symptons of acute exposure include coughing, wheezing, difficult breathing, and upper respraitory track irritation. Prolonged and repeated exposure to concentrations in excess of the TLV or PEL may contribute to delayed respiratory complications.
INGESTION:	No information available.
SKIN:	None expected, but constant contact may cause irritation.

CARCINOGENICITY INFORMATION:
OSHA REGULATED: No NTP LISTED: Yes IARC LISTED: Yes

WARNING! This product contains crystalline silica. IARC Monograph Volume 42, 1987 concludes that " there is limited evidence for the carcinogenicity of crystalline silica to humans". IARC classification - Group 2A.

The National Toxicology Program (NTP), in the Seventh Annual Report on Carcinogens, 1994, has included crystalline silica in its list of substances that are "reasonably anticipated to be carcinogens".

NIOSH has identified crystalline silica as a *Potential Occupational Carcinogen* using the OSHA classification outlined in 29 CFR 1990.103.

IV. FIRST AND AND EMERGENCY PROCEDURES

INHALATION:	Move away from exposure into fresh air conditions.
EYE CONTACT:	Flush with water immediately. Consulta physician if irritation persists.
IF SWALLOWED:	Consult a physician.
SKIN CONTACT:	Wash with mild soap and water.

V. PHYSICAL AND CHEMICAL CHARACTERISTICS

APPEARANCE:	A solid of various shades of white, gray and black		
ODOR:	Earthy odor		
BOILING POINT:	NA	VAPOR PRESSURE:	NA
MELTING POINT:	NA	VAPOR DENSITY:	NA
SPECIFIC GRAVITY:	2.56	EVAPORATION RATE:	NA
SOLUBILITY IN WATER:	Insoluble	PERCENT VOLATILITY:	NA
PH:	NA	VISCOSITY:	NA

VI. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Non-Flammable
EXTINGUISHING MEDIA: NA
FLAMMABLE LIMITS: NA

SPECIAL FIREFIGHTING PROCEDURES: None
UNUSUAL FIRE AND EXPLOSION HAZARDS: None

VII. REACTIVITY DATA

STABILITY:	Stable	INCOMPATIBILITIES:	None
HAZARDOUS DECOMPOSITION:	None	CONDITIONS TO AVOID:	None
HAZARDOUS POLYMERIZATION:	Will not occur		

VIII. SPILL, LEAK AND DISPOSAL INFORMATION

SPILL AND LEAK RESPONSE: Minimize dust generation during cleanup. Vacuum or scoop the material into a container for reclamation or disposal.

WASTE DISPOSAL: Raw (unused) material, as shipped, may be disposed of in a sanitary landfill; However spent material may be contaminated and may require special disposal methods. Consult the proper regulatory authorities.

Ball clay is not listed as a hazardous waste as defined by 40 CFR, Part 261.

IX. SPECIAL HANDLING AND PERSONAL PROTECTION INFORMATION

Avoid unnecessary product agitation to keep dust level to a minimum.
Local exhaust ventilation is recommended for dust generating processes.
Use NIOSH or MSHA approved respirators if dust concentrations exceed the TLV or PEL.
Eye wash stations are recommended in areas where this product is used.
Floors or surfaces covered with this product become extremely slippery when wet.

X. SPECIAL REGULATORY INFORMATION

Ball Clay is subject to the reporting requirements of ERCRA (SARA Title III), as outlined in 40 CFR, Part 370.
Ball Clay is included on the TSCA inventory as a naturally occuring chemical substance, 40 CFR, Part 710.4(b).
Ball Clay is not regulated by theDOT.

THE Feldspar Corporation MATERIAL SAFETY DATA SHEET

1040 Crown Pointe Pkwy. Suite 270, Atlanta, GA 30338 • (404) 392-8660 • Fax (404) 392-8670

SECTION I. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: EPK KAOLIN

CHEMICAL NAME: Kaolinite (CAS No. 1332-58-7)

PRODUCER:
The Feldspar Corporation
1040 Crown Pointe Parkway, Suite 270
Atlanta, GA 30338

TELEPHONE NUMBERS:
(Emergency and Information)
(404) 392-8660 8am-5pm EST M-F
(404) 392-8670 FAX

MSDS No. 9304 DATE PREPARED: March 1, 1994

SECTION II. HAZARDOUS INGREDIENTS

Free Silica (Crystalline Quartz) Formula: SiO_2 Typically 0.1-4% CAS No. 14808-60-7

Kaolin or kaolinite is a naturally occuring hydrous aluminum silicate mineral. Formula: $H_4Al_2Si_2O_9$; SiO_2

SECTION III. PHYSICAL DATA

BOILING POINT: Not Applicable VAPOR PRESSURE: Not Applicable SPECIFIC GRAVITY: 2.56

MELTING POINT: 1740-1785°C SOLUBILITY IN WATER: Negligible PERCENT VOLATILE: Not Applicable

ODOR AND APPEARANCE: Earthy smell when wet. White to light gray lumps; buff-colored powder.

SECTION IV. FIRE AND EXPLOSION DATA: Non-flammable and non-explosive.

SECTION V. HEALTH HAZARD INFORMATION

OSHA PEL: CRYSTALLINE QUARTZ (Respirable) 0.1 mg/m^3 (TWA-TLV)
ACGIH TLV: CRYSTALLINE QUARTZ (Respirable) 0.1 mg/m^3 (TWA-TLV)

HAZARD BY ROUTES OF EXPOSURE:

INHALATION: WARNING: These products contain crystalline silica. Repeated, prolonged inhalation of dust may cause delayed lung injury which may result in silicosis or pneumoconiosis. The International Agency For Research On Cancer in its publication, *"IARC Monographs On The Evaluation Of The Carcinogenic Risk To Humans - Silica and Some Silicates"* - Volume 42, 1987, has concluded that there is sufficient evidence for the carcinogenicity of crystalline silica in experimental animals, and limited evidence for the carcinogenicity of crystalline silica in humans, and has, therefore, classified crystalline silica in Group 2A of Probable Carcinogens. The National Toxicology Program's ("NTP's") Sixth Annual Report on Carcinogens lists crystalline silica (respirable) as a substance which may reasonably be anticipated to be a carcinogen. In support of this listing, NTP cited the IARC conclusions mentioned above. The animal studies found increased tumors in rats resulting from inhalation, intratracheal instillation, and interpleural or intraperitoneal injection. In humans, a number of studies have found an association between lung cancer and exposure to dust containing respirable crystalline silica. These studies only rarely, however, included data on smoking, potential confounding exposures, and assurance of the comparability of the referent population.

INGESTION: Nausea may result from accidental ingestion. May cause cancer, based on animal data.

SECTION V. HEALTH HAZARD INFORMATION (Continued)

EYE: Inflammation of eye tissue may occur from overexposure.

SKIN CONTACT/ABSORPTION: Inflammation from contact with open cuts may occur.

SIGNS AND SYMPTOMS ASSOCIATED WITH EXPOSURE OVER THE TLV:
Short Term: Shortness of breath, caughing associated with inhalation of dust. Long Term: May cause silicosis, a chronic disease of the lungs marked by acute fibrosis; may cause cancer, based on animal data.

EMERGENCY/FIRST AID PROCEDURES:

INHALATION: Move to fresh air; consult physician and /or obtain competent medical assistance as necessary.

INGESTION: Consult physician and/or obtain competent medical assistance.

EYE CONTACT: Flush with water; consult physician and/or obtain competent medical assistance as necessary.

SKIN CONTACT: Wash thoroughly with water.

SECTION VI. REACTIVITY DATA

STABILITY: Kaolin is a stable material under ordinary conditions.

INCOMPATIBILITY: None known.

HAZARDOUS POLYMERIZATION: Not known to occur.

SECTION VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:
If uncontaminated, recover and reuse. If contaminated, collect in suitable containers for disposal. Use appropriate method to avoid creating dust. Avoid breathing dust. Wear a NIOSH/MSHA/OSHA approved respirator.

WASTE DISPOSAL METHOD: May be buried in approved land disposal facility in accordance with Federal, State, and local regulations. Kaolin is not a hazardous waste under RCRA (40 CFR Part 261). Kaolin is not regulated by DOT.

SECTION VIII. CONDITIONS FOR SAFE USE

VENTILATION: Local exhaust required for dust removal. Refer to OSHA 1910.24, ASTM, and/or ANSI Standards. Do not exceed OSHA PEL or ACGIH TLV.

RESPIRATORY PROTECTION: Use NIOSH/MSHA/OSHA approved respirator if dust is present.

EYE PROTECTION: Optional, but recommended.

PROTECTIVE GLOVES: Optional, but recommended.

SECTION IX. SPECIAL PRECAUTIONS

1. Do not breathe dust.
2. Avoid creating dust in closed areas.
3. Use adequate ventilation as recommended by NIOSH/MSHA/OSHA for crystalline silica.

U. S. SILICA COMPANY

MATERIAL SAFETY DATA SHEET

SILICA SAND SOLD UNDER VARIOUS NAMES •
ASTM TESTING SANDS • MYSTIC WHITE® • F–SERIES FOUNDRY SANDS •
PENN SAND® • Q–MIX™ • Q–ROK® • GRAVEL PACK •
SIL–CO–SIL® • HYDRAULIC FRACING SANDS • SUPERSIL® •
MIN–U–SIL®

Dated February 1, 1995

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Names/Trade Names: Silica Sand sold under various names, ASTM TESTING SANDS, MYSTIC WHITE®, F-SERIES FOUNDRY SANDS, PENN SAND®, Q-MIX™, Q-ROK®, GRAVEL PACK, SIL-CO-SIL®, HYDRAULIC FRACING SANDS, SUPERSIL®, MIN-U-SIL®

Synonyms/Common Names: Sand, Silica Sand, Quartz, Crystalline Silica, Flint, Ground Silica.

Manufacturer's Name:
U. S. Silica Company
P. O. Box 187
Berkeley Springs, WV 25411

Emergency Telephone Number:
304-258-2500
304-258-8295 (fax)

Date Prepared: February 1, 1995

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredient: Crystalline silica (quartz), typically 99.2% to 99.9%

Chemical Formula: SiO_2 **CAS#:** 14808-60-7

OSHA PEL: Exposure to airborne crystalline silica shall not exceed an 8-hour time-weighted average limit as stated in 29 CFR § 1910.1000 Table Z-1-A, Air Contaminants, specifically: $\frac{10\ mg/m^3}{\%SiO_2+2}$

ACGIH TLV:
Crystalline Quartz
TLV—TWA = 0.1 mg/M³ (Respirable Crystalline Quartz)
See Threshold Limit Value and Biological Exposure Indices for American Conference of Governmental Industrial Hygienists (latest edition).

Other Recommended Limits: National Institute for Occupational Safety and Health (NIOSH). Recommended standard maximum permissible concentration=0.05 mg/M³ (respirable free silica) as determined by a full-shift sample up to 10-hour working day, 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica.

SECTION 3 — HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs. Crystalline silica (quartz) is classified as a probable human carcinogen.

Crystalline silica (quartz) is not flammable, combustible or explosive. It does not cause burns or severe skin or eye irritation. A single exposure will not result in serious adverse health effects. Crystalline silica (quartz) is not an environmental hazard.

POTENTIAL HEALTH EFFECTS:

Inhalation:

a. Silicosis — Exposure to respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability and death.

b. Cancer — There is evidence that respirable crystalline silica is a carcinogen.

c. Scleroderma — There is evidence that exposure to respirable crystalline silica or the disease silicosis is associated with the increased incidence of scleroderma, an immune system disorder manifested by a fibrosis (scarring) of the lungs, skin and other internal organs.

d. Tuberculosis — Individuals with silicosis are predisposed to develop tuberculosis.

e. Nephrotoxicity — There are several recent studies suggesting exposure to respirable crystalline silica or the disease silicosis is associated with the increased incidence of kidney lesions.

NOTE: Crystalline silica exists in several forms, the most common of which is quartz. If crystalline silica (quartz) is heated to more than 870°C it can change to a form of crystalline silica known as trydimite, and if crystalline silica (quartz) is heated to more than 1470°C, it can change to a form of crystalline silica known as cristobalite. Crystalline silica as trydimite and cristobalite are more fibrogenic than crystalline silica as quartz. The OSHA PEL for crystalline silica as trydimite and cristobalite is one-half the PEL for crystalline silica (quartz); the ACGIH TLV for silica - crystalline trydimite and cristobalite is one-half the TLV for silica - crystalline quartz.

Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

Skin Contact: Not applicable.

Ingestion: Not applicable.

Chronic Effects: The adverse health effects -- silicosis, cancer, scleroderma and tuberculosis -- are chronic effects.

Signs and Symptoms of Exposure: There are generally no signs or symptoms of exposure to crystalline silica (quartz). The symptoms of chronic or ordinary silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis are the same; additionally, weight loss and fever are associated with acute silicosis. The symptoms of scleroderma include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Medical Conditions Generally Aggravated by Exposure: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

See Section 11, Toxicological Information, for additional detail on potential adverse health effects.

SECTION 4 — FIRST AID MEASURES

Inhalation: No specific first aid necessary since the adverse health effects associated with exposure to crystalline silica (quartz) result from chronic exposures. If there is a gross inhalation of crystalline silica (quartz), remove the person immediately to fresh air, give artificial respiration as needed, seek medical attention as needed.

Eye Contact: Wash immediately with water. If irritation persists, seek medical attention.

Skin Contact: Not applicable.

Ingestion: Not applicable.

SECTION 5 — FIRE FIGHTING MEASURES

Flammability:	Crystalline silica (quartz) is non-flammable and non-explosive	**Extinguishing Media**:	None required.
Flash Point:	None	**Special Firefighting Procedures**:	N/A
Flammable Limits:	None	**Unusual Fire and Explosion Hazards**:	None

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Spills: Use dustless methods (vacuum) and place into closable container for disposal, or flush with water. Do not dry sweep. Wear protective equipment specified below.

Waste Disposal Method: See Section 13.

SECTION 7 — HANDLING AND STORAGE

Precautions In Handling and Storing: Avoid breakage of bagged material or spills of bulk material. See control measures in Section 8.

Precautions During Use: Use dustless systems for handling, storage, and clean up so that airborne dust does not exceed the PEL. Use adequate ventilation and dust collection. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain, clean, and fit test respirators in accordance with OSHA regulations. Maintain and test ventilation and dust collection equipment. Wash or vacuum clothing which has become dusty. See also control measures in Section 8.

U. S. Silica Company materials should not be used for sandblasting.

The OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, and 1928.21, and state and local worker or community "right to know" laws and regulations should be strictly followed. WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS-USERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARDS AND OSHA PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT THE OSHA PRECAUTIONS.

See also American Society for Testing and Materials (ASTM) standard practice E 1132-86, "Standard Practice for Health Requirements Relating to Occupational Exposure to Quartz Dust."

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

Local Exhaust: Use sufficient local exhaust to reduce the level of respirable crystalline silica to the PEL. See ACGIH "Industrial Ventilation, A Manual of Recommended Practice" (latest edition).

Respiratory Protection: The following chart specifies the types of respirators which may provide respiratory protection for crystalline silica.

CONDITION Particulate Concentration	MINIMUM RESPIRATORY PROTECTION*
5 x PEL or less	Any dust respirator.
10 x PEL or less	Any dust respirator, except single-use or quarter-mask respirator. Any fume respirator of high efficiency particulate filter respirator Any supplied-air respirator. Any self-contained breathing apparatus.
50 x PEL or less	A high efficiency particulate filter respirator with a full facepiece. Any supplied-air respirator with a full facepiece, helmet, or hood. Any self-contained breathing apparatus with a full facepiece.
500 x PEL or less	A powered air-purifying respirator with a high efficiency particulate filter. A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous-flow mode.
Greater than 500 x PEL or entry and escape from unknown concentrations	Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode. A combination respirator which includes a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure continuous-flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.
***Only NIOSH-approved or MSHA-approved equipment should be used. (See 29 CFR §1910.134).**	

See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection"

Permissible Exposure Levels: See Section 2.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White or tan sand; granular, crushed, or ground		
Boiling Point:	4046°F	**Odor:**	None
Vapor Pressure (mm Hg.):	None	**Specific Gravity (H_2O = 1):**	2.65
Vapor Density (AIR = 1):	None	**Melting Point:**	3110°F
Solubility in Water:	Insoluble in water	**Evaporation Rate (Butyl Acetate = 1):**	None

SECTION 10 — STABILITY AND REACTIVITY

Stability: Crystalline silica (quartz) is stable.

Incompatibility (Materials to Avoid): Contact with powerful oxidizing agents such as fluorine, chlorine trifluoride, oxygen difluoride, may cause fires.

Hazardous Decomposition or Byproducts: Silica will dissolve in hydrofluoric acid and produce a corrosive gas - silicon tetrafluoride.

Hazardous Polymerization: Will not occur.

SECTION 11 — TOXICOLOGICAL INFORMATION

A. SILICOSIS

The major concern associated with exposure to respirable crystalline silica is silicosis, caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic or ordinary, accelerated or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years of exposure to relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms or disability.

Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis and PMF are characterized by lung lesions greater than 1 centimeter in diameter. The symptoms are shortness of breath, wheezing, cough and sputum production. Complicated silicosis and PMF can result in pulmonary heart disease. PMF may be disabling and may lead to death.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

B. CANCER

IARC The International Agency for Research on Cancer, in Volume 42, published in 1987, concluded that there was sufficient evidence of the carcinogenicity of crystalline silica to experimental animals, but that there was limited evidence of the carcinogenicity of crystalline silica to humans. Group 2A.

NTP The National Toxicology Program, in its Sixth Annual Report on Carcinogens, concluded that "silica, crystalline (respirable)" may reasonably be anticipated to be a carcinogen, based on sufficient evidence in experimental animals and limited evidence in humans.

The carcinogenicity of crystalline silica (quartz) is a matter of controversy. A number of studies support an association between silica and cancer. Some are based on work with experimental animals, and there are uncertainties in extrapolating animal data to humans. Also, it appears that the positive animal studies are limited to single species, rats, and that studies using other rodent species have been negative. The results of the numerous epidemiological studies assessing the carcinogenicity of silica in humans are positive and negative. The limitations in the epidemiological studies result from: 1) inadequate silica exposure assessments; 2) possible confounding by exposure to other occupational carcinogens; 3) possible confounding from cigarette smoking. The issues regarding silica, silicosis and lung cancer are set forth in the following materials (among others): Current Pulmonology, Chapter 8, entitled "Occupational Lung Disease", Gee, J. Bernard (1992). Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). Do Silica and Asbestos Cause Lung Cancer?, Arch. Pathol. Lab. Med., Vol. 116, No. 1, pp. 16-19 (1992). Silica: is it a carcinogen, J. Occup. Health & Safety - Aust. NZ, Vol. 6, No. 6, pp. 481-490 (1990). Silica and lung cancer: a controversial issue, Eur. Respir. J., Vol. 4, pp. 730-744 (1991).

C. SCLERODERMA

There is evidence that exposure to respirable crystalline silica or the disease silicosis is associated with the increased incidence of scleroderma, an immune system disorder manifested by a fibrosis (scarring) of the lungs, skin and other internal organs. The following may be consulted for additional information on silica, silicosis and scleroderma (also known as progressive systemic sclerosis): Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). Silica, Silicosis, and Progressive Systemic Sclerosis, British Journal of Industrial Medicine, Volume 42, Number 12, pp. 838-843 (1985). Diseases Associated with Exposure to Silica and Nonfibrous Silicate Minerals, Arch. Pathol. Lab. Med., Volume 112, Number 7, pp. 673-720 (1988).

D. TUBERCULOSIS

Individuals with silicosis are predisposed to develop tuberculosis. The following may be consulted for further information: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994).

E. NEPHROTOXICITY

There are several recent studies suggesting exposure to respirable crystalline silica or the disease silicosis is associated with the increased incidence of kidney lesions. The following may be consulted for additional information on silica, silicosis and nephrotoxicity: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). A study of silica nephrotoxicity in exposed silicotic and non-silicotic workers, British Journal of Industrial Medicine, Vol. 49, No. 1, pp. 35-37 (1992). Further evidence of human silica nephrotoxicity in occupationally exposed workers, British Journal of Industrial Medicine, Volume 50, Number 10, pp. 907-912 (1993).

SECTION 12 — ECOLOGICAL INFORMATION

Crystalline silica (quartz) is not ecotoxic, i.e., there is no data which suggests that crystalline silica (quartz) is toxic to birds, fish, invertebrates, microorganisms or plants. For additional information on crystalline silica (quartz), see sections 9 (physical and chemical properties) and 10 (stability and reactivity) of this MSDS.

SECTION 13 — DISPOSAL CONSIDERATIONS

General: The packaging and material may be landfilled; however, material should be covered to minimize generation of airborne dust.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR 261 et seq.

The above applies to materials as sold by U.S. Silica Company. The material may be contaminated during use, and it is the responsibility of the user to assess the appropriate disposal of the used material.

SECTION 14 — TRANSPORT INFORMATION

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U. S. Department of Transportation Table of Hazardous Materials, 49 CFR 172.101.

SECTION 15 — REGULATORY INFORMATION

UNITED STATES (FEDERAL AND STATE)

TSCA No.: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR 261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR 302.

Emergency Planning and Community Right to Know Act: Crystalline silica (quartz) is not an extremely hazardous substance under Section 302 and is not a toxic chemical subject to the requirements of Section 313.

Clean Air Act: Crystalline silica (quartz) mined and processed by U.S. Silica Company was not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR 175.300(b)(3)(xxvi).

NTP: Respirable crystalline silica (quartz) is classified as a probable carcinogen.

OSHA Carcinogen: Crystalline silica (quartz) is not listed.

California Proposition 65: Crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

CANADA

Domestic Substances List: U. S. Silica Company products, as naturally occurring substances, are on the Canadian DSL.

WHMIS Classification: D-2A

OTHER

EINECS No.: 231-545-4

EEC Label (Risk/Safety Phrases): R 48/20, R 40/20, S22, S38

IARC: Crystalline silica (quartz) is classified in IARC Group 2A.

National, state, provincial or local emergency planning, community right to know or other laws, regulations or ordinances may be applicable--consult applicable national, state, provincial or local laws.

Section IV: Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
N/A	N/A	N/A	N/A

Extinguishing Media

N/A

Special Fire Fighting Procedures

N/A

Unusual Fire and Explosion Hazards

N/A

Section V: Reactivity Data

Stability	Unstable		Conditions to Avoid: None
	Stable	X	

Incompatibility (Materials to Avoid):

Silica will dissolve in hydroflouric acid and produce a corrosive gas--silicon tetraflouride. Contact with powerful oxidizing agents fluorine, chlorine, trifluoride, manganese trioxide and oxygen difluoride may cause fires.

Hazardous Decomposition or Byproducts

None

Hazardous Polymerization	May Occur		Conditions to Avoid None
	Will not Occur	X	

Section VI: Health Hazard Data

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

Health Hazards (Acute and Chronic):

Excessive inhalation of dust may result in respiratory disease, including silicosis, pneumoconiosis and pulmonary fibrosis. The International Agency for Research on Cancer (IARC) has evaluated in Volume 42, Monographs on the Evaluation of the Carcinogenicity Risk of Chemicals to Humans, Silica and Some Silicates (1987), that there is "sufficient evidence for the carcinogenicity of crystalline silica to experimental animals" and "limited evidence" with respect to humans.

Carcinogenicity: NTP? No IARC Monographs? Yes OSHA Regulated? No

Level 2A Grouping

Signs and Symptoms of Exposure:

Symptoms of excessive exposure include shortness of breath and reduced pulmonary function. This inert material gives no potential acute toxic hazard.

Medical Conditions Generally Aggravated by Exposure:

Individuals with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure.

Emergency and First Aid Procedures:

Eyes--Flush with running water. Gross Inhalation--Remove to fresh air. Give oxygen with artificial respiration as needed. Seek medical attention for treatment, observation and support as needed.

Section VII: Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled:

If uncontaminated--collect, using dustless method (water or vacuum). If contaminated --use appropriate method in light of nature of contamination. Use appropriate container.

Waste Disposal Method:
If uncontaminated, dispose as an inert, non-metallic mineral. If contaminated--use appropriate method in light of contamination in accordance with Federal, State, and local laws.

Precautions to Be Taken in Handling and Storing:
Take normal precautions against bag breakage or spills of bulk material. Avoid creation of respirable dust.

Other Precautions:
Use adequate ventilation and dust collection. Do not permit dust to accumulate in work area. Maintain and use proper and clean respiratory equipment. Clean clothing which has become dusty. See Section VIII. WARN and TRAIN your EMPLOYEES and WARN your CUSTOMERS (in the event of resale) in accordance with all applicable Federal and State "Right to Know" laws and regulations.

Section VIII: Control Measures

Respiratory Protection (Specify Type):

Use conventional particulate respiratory protection based on considerations of airborne concentrations and duration of exposure. See most recent standards of the American National Standard Institute (ANSI Z.88.2), the Occupational Safety and Health Administration (OSHA) (29 CFR Part 1910.134) and the Mine Safety and Health Administration (MSHA) (30 CFR Part 56).

Ventilation	Local Exhaust: To meet PEL requirements	Special: N/A
	Mechanical (General): To meet PEL requirements	Other: To meet other PEL requirements
Protective Gloves: Recommended		Eye Protection: Recommended

Other Protective Clothing or Equipment:
As appropriate in light of specific application.

Work/Hygienic Practices:
Avoid creating and breathing dust.