



F-65 + F-95

MATERIAL SAFETY DATA SHEET

recd from N.E. Silica 5/95

Identity: Crystalline Silica (Quartz)

SECTION

Manufacturer's Name
U.S. Silica Company

Emergency Telephone Number
304-258-2500

Address
P.O. Box 187
Berkeley Springs, WV 25411

Telephone Number for Information
304-258-2500

Date Prepared
05-06-92

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components:
Silica, Crystalline Quartz (respirable)

Specific Chemical Identity: Silicon Dioxide SiO2 (CAS 14808-60-7)

Common Names: Silica, Flint, Sand, Crystalline Free Silica, Quartz, Ground Silica, trade names (see Page 4).

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:

Silica, Crystalline Quartz (respirable) 0.1 mg/M3

ACGIH TLV: Crystalline Quartz
TLV-TWA = 0.1 mg/M3 (Respirable Dust)
See Threshold Limit Value and Biological Exposure Indices for 1991-1992
American Conference of Governmental Industrial Hygienists.

Other Limits Recommended: 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 III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 4046°F
Vapor Pressure (mm Hg): None
Vapor Density (AIR = 1): None
Specific Gravity (H2O = 1): 2.65
Melting Point: 3050°F
Evaporation Rate: (Butyl Acetate = 1) None
Solubility in Water: Insoluble in water
Appearance and Odor: White or tan sand, granular, crushed, or ground No odor or taste.

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): Non-flammable

Flammable Limits: None LEL: None UEL: None

Extinguishing Media:

None required; sand may be used as extinguishing media.

Special Fire Fighting Procedures: N/A

Unusual Fire and Explosion Hazards:

Crystalline silica is neither a fire nor an explosion hazard. Crystalline silica may be used to put out Class A and B fires.

SECTION V — REACTIVITY DATA

Stability: Unstable: Stable: X Conditions to Avoid: None

Incompatibility (Materials to Avoid):

Contact with powerful oxidizing agents such as flourine, chlorine trifluoride, manganese trioxide, oxygen difluoride, may cause fires.

Hazardous Decomposition or Byproducts:

Silica will dissolve in Hydrofluoric Acid and produce a corrosive gas - silicon tetrafluoride.

Hazardous

Polymerization: May Occur: Will Not Occur: X Conditions to Avoid: None

SECTION VI — HEALTH HAZARD DATA

Route(s) of Entry:

Inhalation? Yes Skin? No Ingestion? No

Health Hazards (Acute and Chronic):

Prolonged exposure to respirable crvstalline quartz may cause delayed (chronic) lung injury (silicosis). Acute or rapidly developing silicosis may occur in a short period of time in heavy exposure in certain occupations such as sandblasters. Silicosis is a form of disabling pulmonary fibrosis which can be progressive and may lead to death.

Carcinogenicity:

NTP? Yes

The National Toxicology Program (NTP) published its Sixth Annual Report on Carcinogens which concludes that "silica, crystalline (respirable)" may reasonably be anticipated to be a carcinogen. The NTP conclusion is based on sufficient evidence for the carcinogenicity of respirable crystalline silica in experimental animals and limited evidence in numans.

IARC Monographs? Yes

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 42, 1987) concludes that there is sufficient evidence for the carcinogenicity of crystalline silica to experimental animals, and that there is limited evidence of the carcinogenicity of crystalline silica to humans. IARC Class 2A.

Signs and Symptoms of Exposure:

Undue breathlessness, wheezing, cough and sputum production.

Medical Conditions Generally Aggravated by Exposure:

Pulmonary function may be reduced by inhalation of respirable crystalline silica. Also lung scarring produced by such inhalation may lead to a progressive massive fibrosis of the lung which may aggravate other pulmonary conditions and diseases and which increases susceptibility to pulmonary tuberculosis. Progressive massive fibrosis may be accompanied by right heart enlargement, heart failure, and pulmonary failure. Smoking aggravates the effects of exposure.

Emergency and First Aid Procedures:

For sand in eyes, wash immediately with water. If irritation persists, seek medical attention. For gross inhalation, remove person immediately to fresh air, give artificial respiration as needed, seek medical attention as needed.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE**Steps To Be Taken in Case Material is Released or Spilled:**

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:

Dispose in accordance with Federal, State, and Local regulations.

Precautions To Be Taken In Handling and Storing:

Avoid breakage of bagged material or spills of bulk material. See control measures in Section VIII.

Other Precautions:

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 VIII.

See OSHA Hazard Communication Rule 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. We recommend that smoking be prohibited in all areas where respirators must be used. **WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS-USERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARD 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 VIII – CONTROL MEASURES**Respiratory Protection**

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

RESPIRATORY PROTECTION FOR CRYSTALLINE SILICA

CONDITION	MINIMUM RESPIRATORY PROTECTION*
Particulate Concentration Up to 5 x PEL	Any dust respirator.
Up to 10 x PEL	Any dust respirator, except single-use or quarter-mask respirator. Any fume respirator or high efficiency particulate filter respirator. Any supplied-air respirator. Any self-contained breathing apparatus.
Up to 50 x PEL	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.
Up to 500 x PEL	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.
Abrasive Blasting	Any type CE, supplied-air respirator with a full facepiece, hood, or helmet, operated in a positive-pressure mode. (See 29 CFR § 1910.94 (a)).

*Only NIOSH-approved or MSHA-approved equipment should be used. (See 29 CFR § 1910.134).

See also ANSI standard Z88.2-1980 "Practices for Respiratory Protection," and standard Z9.4-1984 "Ventilation and Safe Practices of Abrasive Blasting Operations."

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

Mechanical
See "Other Precautions" under Section VII.

Special
See "Other Precautions" under Section VII.

Other
See "Other Precautions" under Section VII.

Protective Gloves
Optional

Eye Protection
Wear protective shield (safety glasses) when exposed to dust particles.

Other Protective Clothing or Equipment
Optional.

Work/Hygienic Practices
Avoid creating and breathing dust. See "Other Precautions" under Section VII

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful health effects which may be caused by purchase, resale, use or exposure to our silica. Customers-users of silica must comply with all applicable health and safety laws, regulations and orders.

U.S. SILICA COMPANY TRADE NAMES

- | | |
|---------------------------|---------------|
| ASTM TESTING SANDS | MYSTIC WHITE® |
| F-SERIES FOUNDRY SANDS | PENN SAND® |
| FLINTSHOT® | O-MIX™ |
| FLINTSHOT® BLASTING SANDS | O-ROK® |
| GRAVEL PACK | SIL-CO-SIL® |
| HYDRAULIC FRACING SANDS | SUPERSIL® |
| MIN-U-SIL® | |