U.S. SILICA COMPANY
SAFETY DATA SHEET

Section 1: Chemical Product and Company Information

1.1 Product Identifier
Product Name: Silica Sand, Ground Silica and Fine Ground Silica
Sand and Ground Silica Sand (sold under various names: ASTM TESTING SANDS • GLASS SAND • FILPRO® · FLINT SILICA • DM-SERIES • F-SERIES • FOUNDRY SANDS • FJ-SERIES H-SERIES • L-SERIES • N-SERIES • NJ SERIES • OK-SERIES • P-SERIES • T-SERIES • hydraulic fracturing sand, all sizes • frac sand, all sizes • MIN-U-SIL® Fine Ground Silica • MYSTIC WHITE® • #1 DRY • #1 SPECIAL • PENN SAND® • PRO WHITE® · SILURIAN® · Q-ROK® • SIL-CO-SIL® Ground Silica • MICROSIL® • SUPERSIL® • MASON SAND • GS SERIES • PERSPEC • proppant, all sizes • SHALE FRAC® - SERIES • KOSSE WHITE® • OTTAWA WHITE® • OPTIJUMP® • LIGHTHOUSE ™.

Chemical Name or Synonym: Crystalline Silica (Quartz), Sand, Silica Sand, Flint, Ground Silica, Fine Ground Silica, Silica Flour.

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against
Product Use: (non-exhaustive list): brick, ceramics, foundry castings, glass, grout, hydraulic, fracturing sand, frac sand, proppant, mortar, paint and coatings, silicate chemistry, silicone, rubber, thermoset plastics.
DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

1.3 Details of the Supplier of the Safety Data Sheet
Manufacturer: U.S. Silica Company
24275 Katy Freeway, Suite 600
Katy, TX 77494
USA
Information Phone: 800-243-7500
Fax: 281-394-9017

1.4 Emergency Telephone Number
844-468-7263 (Monday through Friday – 9 to 4 pm Central Standard Time)

SDS Date of Preparation/Revision: 22 March 2020

Section 2: Hazards Identification

2.1 Classification of the Substance or Mixture

EU Classification (1272/2008): Specific Target Organ Toxicity Repeated Exposure Category 1

2.2 Label Elements:

DANGER
H372 Causes damage to lungs through prolonged or repeated exposure by inhalation.
P260 Do not breathe dust.
P285 In case of inadequate ventilation wear respiratory protection.
P501 Dispose of contents/containers in accordance with local regulations.

2.3 Other Hazards: None identified

Section 3: Composition/Information on Ingredients

3.1 Substance

Component	CAS Number/ EINECS Number	Amount	EU/CLP Classification (1272/2008)
Crystalline Silica (quartz)	14808-60-7 / 238-878-4	95-99.9%	STOT RE 1 (H372)

Refer to Section 16 for Full Text of EU/CLP Classes and H Statements

Section 4: First Aid Measures

4.1 Description of First Aid Measures

First Aid

Eyes: Wash immediately with plenty of water. Do not rub eyes. If irritation persists, seek medical attention.

Skin: First aid is not required.

Ingestion: If large amounts are swallowed, get immediate medical attention.

Inhalation: First aid is not generally required. If irritation develops from breathing dust, move the person from the overexposure and seek medical attention if needed.

See Section 11 for more detailed information on health effects.

4.2 Most Important symptoms and effects, both acute and delayed: Particulates may cause abrasive eye injury. Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer.

4.3 Indication of any immediate medical attention and special treatment needed: Immediate medical attention is not required.

Section 5: Fire Fighting Measures

5.1 Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

5.2 Special Hazards Arising from the Substance or Mixture: Product is not flammable, combustible or explosive.

5.3 Advice for Fire-Fighters: None required.

Section 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing and respiratory protection. Avoid generating airborne dust during clean-up.

6.2 Environmental Precautions: No specific precautions. Report releases to regulatory authorities as required by local, state and federal regulations.

6.3 Methods and Material for Containment and Cleaning Up: Avoid dry sweeping. Do not use compressed air to clean spilled sand or ground silica. Use water spraying/flushing or ventilated or HEPA filtered vacuum cleaning system, or wet before sweeping. Dispose of in closed containers.

6.4 Reference to Other Sections:
Refer to Section 13 for disposal information and Section 8 for protective equipment.

Section 7: Handling and Storage

7.1 Precautions for Safe Handling: Do not generate dust. Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Respirable crystalline silica dust may be in the air without a visible dust cloud. Use adequate exhaust ventilation and dust collection. Maintain and test ventilation and dust collection to reduce respirable crystalline silica dust levels to below the occupational exposure limit. Use all available work practices to control dust exposures, such as water sprays. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Keep airborne dust concentrations below permissible exposure limits.

Where necessary to reduce exposures below the applicable exposure limit, wear a respirator approved for silica containing dust when using, handling, storing or disposing of this product or bag. See Section 8, for further information on respirators. Do not alter the respirator. Do not wear a tight-fitting respirator with facial hair such as a beard or mustache that prevents a good face to face piece seal between the respirator and face. Maintain, clean, and fit test respirators in accordance with applicable standards. Wash or vacuum clothing that has become dusty.

Participate in training, exposure monitoring, and health surveillance programs to monitor any potential adverse health effects that may be caused by breathing respirable crystalline silica. All applicable national and local worker or community "right-to-know" laws and regulations should be strictly followed.

7.2 Conditions for Safe Storage, Including any Incompatibilities: Use dust collection to trap dust produced during loading and unloading. Keep containers closed and store bags to avoid accidental tearing, breaking, or bursting.

7.3 Specific end use(s):
Industrial uses: Various commercial and industrial applications.
Professional uses: Various commercial and industrial applications.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters:

Chemical Name	ACGIH TLV	EU IOEL	UK OEL	Germany	France
Crystalline Silica (quartz)	0.025 mg/m3 TWA (respirable dust)	None Established	0.1 mg/m3 TWA (respirable fraction)	None Established	0.1 mg/m3 TWA (respirable)

Where not listed above, refer to local regulations for applicable exposure limits

DNEL: None established
PNEC: None established

If crystalline silica (quartz) is heated to more than 870°C, quartz can change to a form of crystalline silica known as tridymite; if crystalline silica (quartz) is heated to more than 1470°C, quartz can change to a form of crystalline silica known as cristobalite. In some countries, the exposure limits for crystalline silica as tridymite or cristobalite is different than the exposure limit for crystalline silica (quartz).

8.2 Exposure Controls:
Recommended Monitoring Procedures: Collection on filters and analysis by x-ray diffraction. Size selective sampling is recommended.

Appropriate engineering controls: Use adequate general or local exhaust ventilation to maintain concentrations in the workplace below the applicable exposure limits listed above.

Personal Protective Measurers

Respiratory Protection: If it is not possible to reduce airborne exposure levels to below the applicable limit with ventilation, follow local regulations to assist you in selecting respirators that will reduce personal exposures to below the limits. Refer to EN 529 or member state-specific guidance on use and selection of respiratory protection.

Eye Protection: Safety glasses with side shields or goggles recommended if eye contact is anticipated (EN 166)

Skin Protection: Maintain good industrial hygiene. Protection recommended for workers suffering from dermatitis or sensitive skin.

Other Protection: None known.

Section 9: Physical and Chemical Properties

9.1 Information on basic Physical and Chemical Properties

Appearance and Odor: White or tan sand: granular, crushed or ground to a powder.

Solubility in Water:	Insoluble	**Boiling Point:**	4046°F/2230°C
Odor Threshold:	Not determined	**Partition Coefficient:**	Not applicable
pH:	6-8	**Melting Point:**	3110°F/1710°C
Specific Gravity:	2.65	**Vapor Density:**	Not applicable
Evaporation Rate:	Not applicable	**Vapor Pressure:**	Not applicable
Flammability(solid/gas):	Not applicable	**Flash Point:**	Not applicable
Explosive Limits:	Not applicable	**Autoignition Temperature:**	Not determined
Decomposition Temperature:	Not determined	**Viscosity:**	Not applicable

Explosive Properties:	Not applicable	**Oxidizing Properties:**	Not applicable

9.2 Other Information: None

Section 10: Stability and Reactivity

10.1 Reactivity: Not reactive under normal conditions of use.

10.2 Chemical Stability: Stable.

10.3 Possibility of Hazardous Reactions: Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride, may cause fires.

10.4 Conditions to Avoid: Avoid generation of dust in handling and use.

10.5 Incompatible Materials: Powerful oxidizers such as fluorine, chlorine trifluoride, and oxygen difluoride and hydrofluoric acid.

10.6 Hazardous Decomposition Products: Silica will dissolve in hydrofluoric acid and produce a corrosive gas, silicon tetrafluoride.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects:

Acute effects of exposure:
Inhalation: Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath.
Ingestion: Ingestion in an unlikely route of exposure. If dust is swallowed, it may irritate the mouth and throat.
Skin contact: No adverse effects are expected.
Eye contact: Particulates may cause abrasive injury.

Chronic effects: Prolonged inhalation of respirable crystalline silica may cause lung disease, silicosis, lung cancer and other effects as indicated below.
The method of exposure that can lead to the adverse health effects described below is inhalation.

A. SILICOSIS
The major concern is silicosis, caused by the inhalation 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 (10 to 20 or more) of prolonged repeated inhalation of 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, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Complicated silicosis or PMF symptoms, if

present, are shortness of breath and cough. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pumonale).

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

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

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that "crystalline silica in the form of quartz or cristobalite dust is *carcinogenic to humans (Group 1)".* For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C,"A Review of Human Carcinogens: Arsenic, Metals, Fibres and Dusts " (2011).

C. AUTOIMMUNE DISEASES
Several studies have reported excess cases of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis -- among silica-exposed workers.

D. TUBERCULOSIS
Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to tuberculosis bacteria. Individuals with chronic silicosis have a three-fold higher risk of contracting tuberculosis than similar individuals without silicosis.

E. KIDNEY DISEASE
Several studies have reported excess cases of kidney diseases, including end stage renal disease, among silica-exposed workers. For additional information on the subject, the following may be consulted: "Kidney Disease and Silicosis", Nephron, Volume 85, pp. 14-19 (2000).

F. NON-MALIGNANT RESPIRATORY DISEASES
The reader is referred to Section 3.5 of the NIOSH Special Hazard Review cited below for information concerning the association between exposure to crystalline silica and chronic bronchitis, emphysema and small airways disease. There are studies that disclose an association between dusts found in various mining occupations and non-malignant respiratory diseases, particularly among smokers. It is unclear whether the observed associations exist only with underlying silicosis, only among smokers, or result from exposure to mineral dusts generally (independent of the presence or absence of crystalline silica, or the level of crystalline silica in the dust).

Sources of information:
The ***NIOSH Hazard Review - Occupational Effects of Occupational Exposure to Respirable Crystalline Silica*** published in April 2002 summarizes and discusses the medical and epidemiological literature on the health risks and diseases associated with occupational exposures to respirable crystalline silica. The *NIOSH Hazard Review* is available from NIOSH - Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226, or through the NIOSH web site, www.cdc.gov/niosh/topics/silica, then

click on the link "NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica".

For a more recent review of the health effects of respirable crystalline silica, the reader may consult *Fishman's Pulmonary Diseases and Disorders*, Fourth Edition, Chapter 57. "Coal Workers' Lung Diseases and Silicosis".

Acute Toxicity Values:
Crystalline Silica (quartz): LD50 oral rat >22,500 mg/kg

Skin corrosion/irritation: Does not meet the criteria for classification.

Eye damage/ irritation: Does not meet the criteria for classification.

Respiratory Irritation: Does not meet the criteria for classification.

Skin Sensitization: Does not meet the criteria for classification.

Respiratory Sensitization: Does not meet the criteria for classification.

Germ Cell Mutagenicity: Does not meet the criteria for classification.

Carcinogenicity: See above under CANCER.

Developmental / Reproductive Toxicity: No specific data is available, however, there is no evidence that silica exposure has any effect on reproduction.

Specific Target Organ Toxicity (Single Exposure): Does not meet the criteria for classification.

Specific Target Organ Toxicity (Repeated Exposure): See above.

Aspiration Toxicity: Not an aspiration hazard.

Section 12: Ecological Information

12.1 Toxicity: Crystalline silica (quartz) is not known to be ecotoxic.

12.2 Persistence and degradability: Silica is not degradable.

12.3 Bioaccumulative Potential: Silica is not bioaccumulative.

12.4 Mobility in Soil: Silica is not mobile in soil.

12.5 Results of PBT and vPvB Assessment: None required.

12.6 Other Adverse Effects: No data available.

Section 13: Disposal Considerations

13.1 Waste Treatment Methods:
Dispose in accordance with all applicable local, state/provincial and national/ federal regulations in light of the contamination present. Local regulations may be more stringent than regional and national requirements. It is the responsibility of the waste generator to determine the toxicity and physical characteristics of the material to determine the proper waste identification and disposal in compliance with applicable regulations.

Section 14: Transport Information

	14.1 UN Number	14.2 UN Proper Shipping Name	14.3 Hazard Class(s)	14.4 Packing Group	14.5 Environmental Hazards
US DOT	None	Not Regulated	None	None	
CANADIAN TDG	None	Not Regulated	None	None	
EU ADR/RID	None	Not Regulated	None	None	
IMDG	None	Not Regulated	None	None	
IATA/ICAO	None	Not Regulated	None	None	

14.6 Special Precautions for User: None identified

14.7 Transport in Bulk According to Annex III MARPOL 73/78 and the IBC Code: Not applicable. Transported in packaged form only.

Section 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

INTERNATIONAL INVENTORIES

US EPA TSCA Inventory: All of the components of this product are listed on the EPA TSCA inventory.

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

Australian Inventory of Chemical Substances (AICS): All of the components of this product are listed on the AICS inventory or exempt from notification requirements.

China: Silica is listed on the IECSC inventory or exempt from notification requirements.

Korea Existing Chemicals Inventory (KECI) (set up under the Toxic Chemical Control Law):
Listed on the ECL with registry number 9212-5667. Silica is not subject to Registration under K-REACH as a natural mineral.

Japan Ministry of International Trade and Industry (MITI): All of the components of this product

are existing chemical substances as defined in the Chemical Substance Control Law Registry Number 1-548.

New Zealand: Silica is listed on the HSNO inventory or exempt from notification requirements.

Philippines Inventory of Chemicals and Chemical Substances (PICCS): Listed for PICCS.

Taiwan: Silica is listed on the CSNN inventory or exempt from notification requirements.

EU REACH: Silica is not subject to registration per Annex V as a natural mineral. Silica is not restricted under REACH.

EU SVHC: These products do not contain substances of very high concern (SVHC) under REACH.

EU PIC: These products are not subject to the Prior Informed Consent Regulation (PIC).

Section 16: Other Information

GHS Classes and Hazard Statements for Reference (See Sections 3):
STOT-RE Cat 1 - Specific Target Organ Toxicity (Repeated Exposure) Category 1
H372 Causes damage to lungs through prolonged or repeated exposure by inhalation

Effective Date: 22 March 2020
Supersedes Date: 1 May 2017

U. S. Silica Company Disclaimer

The information and recommendations contained herein are based upon data believed to be up to-date and 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 effects that may be caused by purchase, resale, use or exposure to our silica. Customers and users of silica must comply with all applicable health and safety laws, regulations, and orders. In particular, they are under an obligation to carry out a risk assessment for the particular work places and to take adequate risk management measures in accordance with the national implementation legislation of EU Directives 89/391 and 98/24.