

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

COMPANY ADDRESS: Guiana Shield Resources Inc.
100 4th Avenue, Subryanville
Georgetown, Guyana
South America

EMERGENCY TELEPHONE NUMBERS: (592) 600-6161
(592) 600-0752

PRODUCT NAME : SILICA SAND, QUARTZ
CHEMICAL NAME : Crystalline Silica (Quartz), Sand, Silica Sand
PRODUCT USE : (non-exhaustive list): brick, ceramics, foundry castings, grout, glass, mortar, paint and coatings

SECTION 2 - HAZARDS IDENTIFICATION SUMMARY

(As defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200)

HEALTH HAZARDS:

Classification:

PHYSICAL	HEALTH
Not Hazardous	Carcinogen Category 1A Specific Target Organ Toxicity – Repeated Exposure Category 1

DANGER

May Cause cancer by inhalation. Causes damage to lungs through prolonged or repeated exposure by inhalation.

Response:

May cause cancer by inhalation. Causes damage to lungs through prolonged or repeated exposure by inhalation.

Response:

If exposed or concerned: Get medical advice.

Disposal:

Dispose of contents/containers in accordance with local regulation.

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Do not eat, drink or smoke when using this product.

Wear protective gloves and safety glasses or goggles. In case of inadequate ventilation wear respiratory protection.

SECTION 3 - COMPOSITION, INFORMATION OF INGREDIENTS

COMPONENT	CHEMICAL FORMULA	TYPICAL % BY WEIGHT	CAS NO.
Crystalline Silica	SiO ₂	99.9	14808-60-7

SECTION 4 - FIRST AID MEASURES

First Aid responders should use protective equipment in Section 8 if there is a potential for exposure to product.

IF SWALLOWED:

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

IF ON SKIN OR CLOTHING:

First aid is not required.

IF IN EYES:

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

IF INHALED:

First aid is not required.

Most important symptoms/effects, 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.

Indication of immediate medical attention and special treatment, if necessary:

Immediate medical attention is not required.

SECTION 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD:

Can burn in fire, releasing irritating and toxic gases due to thermal decomposition or combustion

FIRE FIGHTING INSTRUCTIONS:

Product is not flammable, combustible or explosive

FIRE FIGHTING EQUIPMENT:

None required.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures:

Wear appropriate protective clothing and respiratory protection (see Section 8). Avoid generating airborne dust during clean-up.

Environmental precautions:

No specific precautions. Report releases to regulatory authorities if required by local, state and federal regulations.

Methods and materials 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/HEPA filtered vacuum cleaning system. Wet before sweeping. Dispose of in closed containers.

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling:

Avoid generating 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 to reduce respirable crystalline silica dust levels to below the permissible exposure limit ("PEL"). Maintain and test ventilation and dust collection equipment. 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 PEL or other applicable limit (if lower than the PEL), 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 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. The OSHA Respirable Crystalline Silica Standards; 29CFR1910.1053, 1915.1053 and 1926.1053, the OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.1200, 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.

DO NOT USE PRODUCT FOR SAND BLASTING APPLICATIONS

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.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

Ventilation:

Use local exhaust as required to maintain exposures below the occupational exposure limits; refer to the governing "The Occupational Health & Safety Regulations" for the recommended practices.

Respiratory Protection:

Use only NIOSH approved respiratory protection equipment with a minimum N95 rating. Avoid breathing dust produced during the use of this and handling of this material. If the workplace airborne crystalline silica concentration is unknown for a given task, Air Quality Monitoring should be conducted in order to determine the appropriate level of respiratory protection. Ensure the appropriate respirators are worn during and following the task, including clean up or whenever airborne dust is present, to insure ambient dust levels are below occupational exposure limits. Provisions should be made for a respiratory protection-training program. **Also see ANSI standard Z88.2 "American National Standard for Respiratory Protection", or the CSA Standard Z94.4-02 "Selection, Use, And Care of Respirators."**

Gloves:

Recommended in situations where skin abrasions for sand may occur

Eye:

Recommended in order to prevent any particulate from entering the eye.

Clothing:

Use protective clothing as appropriate for the work environment.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White granular
Odor:	None
pH:	6 - 8
Melting Point:	3110F/1710C
Boiling Point:	4046F/2230C
Flash Point:	Not applicable
Evaporation Rate:	Not applicable
Flammability:	Not flammable
Flammability Limits:	Not applicable
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Density:	2.65
Solubility:	Insoluble in water
Partition Coefficient:	Not applicable
Auto-Ignition Temperature:	Not determined
Decomposition Temperature:	Not determined
Viscosity:	Not applicable

*Listed density is an approximate value and does not necessarily represent that of a specific batch.

SECTION 10 - STABILITY AND REACTIVITY

PRODUCT REACTIVITY:

Non-reactive under normal conditions of use.

CHEMICAL STABILITY:

Stable.

HAZARDOUS POLYMERIZATION:

Contact with powerful oxidizing agents, such as fluorine, chlorine, trifluoride and oxygen difluoride, may cause fires.

CONDITIONS TO AVOID:

Avoid generation of dust in handling use.

INCOMPATIBLE MATERIALS:

Powerful oxidizers such as fluorine, chlorine, trifluoride, and oxygen difluoride and hydrofluoric acid.

HAZARDOUS DECOMPOSITION PRODUCTS:

Silica will dissolve in hydrofluoric acid and produce a corrosive gas, silicon tetrafluoride.

SECTION 11 - TOXICOLOGICAL INFORMATION

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

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 pulmonale).

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).

NTP classifies "Silica, Crystalline (respirable size)" as Known to be a human carcinogen.

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".

The US Occupational Safety and Health Administration (OSHA) published a summary of respirable crystalline silica health effects in connection with OSHA's Proposed Rule regarding occupational exposure to respirable crystalline silica. The summary was published in the September 12, 2013 Federal Register, which can be found at www.federalregister.gov/articles/2013/09/12/2013-20997/occupational-exposure-to-respirable-crystalline-silica.

Numerical measures of toxicity:

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

SECTION 12 - ECOLOGICAL INFORMATION

Crystalline silica (quartz) is not known to be ecotoxic. There is no evidence to suggest that crystalline silica is toxic to birds, fish, invertebrates, microorganisms, or plant life.

SECTION 13 - DISPOSAL CONSIDERATIONS

Discard any product, residue, disposable container or liner in full compliance with national regulations.

SECTION 14 - TRANSPORT INFORMATION

UN number:

None

UN proper shipping name:

Not regulated

Transport hazard classes(es):

None

Packing group, if applicable:

None

Environmental hazards:

None

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code):

Not determined

Special precautions:

None known.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES (FEDERAL AND STATE)

TSCA Status:

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

RCRA:

This product 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 (SARA Title III):

This product contains the following chemicals subject to SARA 302 or SARA 313 reporting: None above the de minimus concentrations.

Clean Air Act:

Crystalline silica (quartz) mined and processed by U.S. Silica Company is 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).

California Proposition 65:

Crystalline silica (airborne particles of respirable size) is classified as a substance known to the State of California to be a carcinogen.

California Inhalation Reference Exposure Level (REL):

California established a chronic non-cancer effect REL of 3 µg for silica (crystalline, respirable). A chronic REL is an airborne level of a substance at or below which no non-cancer health effects are anticipated in individuals indefinitely exposed to the substance at that level.

Massachusetts Toxic Use Reduction Act:

Silica, crystalline (respirable size, <10 microns) is "toxic" for purposes of the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act:

Quartz is a hazardous substance under the Act, but it is not a special hazardous substance or an environmental hazardous substance.

Texas Commission on Environmental Quality:

The Texas CEQ has established chronic and acute Reference Values and short term and long term Effects Screening Levels for crystalline silica (quartz). The information can be accessed through www.tceq.texas.gov.

CANADA

Domestic Substances List:

Guiana Shield Resources Inc. Silica products, as naturally occurring substances, are on the Canadian DSL.

WHMIS Classification:

D2A

SECTION 16 - OTHER INFORMATION

Hazardous Material Information System (HMIS):

HMIS HAZARD RATINGS	HEALTH	*
	FLAMMABILITY	0
	PHYSICAL HAZARD	0
	PROTECTIVE EQUIPMENT	E
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	

- For further information on health effects, see Sections 2, 8 and 11 of this MSDS.

National Fire Protection Association (NFPA)

NFPA HAZARD RATINGS	HEALTH	0
	FLAMMABILITY	0
	PHYSICAL HAZARD	0
	4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	

Web Sites with Information about Effects of Crystalline Silica Exposure:

The Occupational Safety and Health Administration (OSHA) web site contains information on the OSHA standard related to respirable crystalline silica at <https://www.osha.gov/silica/index.html>.

The U.S. National Institute for Occupational Safety and Health (NIOSH) maintains a site with information about crystalline silica and its potential health effects at <http://www.cdc.gov/niosh/topics/silica>.

The IARC Monograph that includes crystalline silica, Volume 100C, can be accessed in PDF form at the IARC web site, <http://monographs.iarc.fr/ENG/Monographs/PDFs/index.php>.

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