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MSDS – Material Safety Data Sheet
MSDS # Silica

Section 1 – Company & Product Identification

Manufacturer	Mill Creek Sand & Gravel (1980) Ltd. Box 10 Redwater, Alberta T0A 2W0	
Phone Numbers	Head Office	780 942-4914
	Sales Representative	780 940-1660
	Head Office Fax	780 942-4915
Emergency Contact	**Mark Oleksyn**	**780 777-9587**
Synonyms	Silica sand, quartz, crystalline silica, silica dioxide	
Product Uses	Golf course sand, play sand, traction sand, and frac sand	

Section 2 – Product Composition

Hazardous Ingredients

Item	Crystalline Silica	Aluminum Oxide	Iron Oxide	Titanium Oxide
Chemical Formula	SiO_2	Al_2O_3	Fe_2O_3	TiO_2
Typical % by Weight *	92.0 – 94.0	< 5.00	<1.00	<0.09
CAS #	14808-60-7	1344-28-1	1309-37-1	13463-67-7

Typical Values – Data shown is accurate and reliable, but not a specification

Exposure Limits (respirable fraction) In Air

OSHA – PEL	$\frac{10 \text{ mg} / m^3}{\% SiO_2 + 2}$	(8 hour time weighed average)
ACGIH	0.05 mg / m^3	(8 hour time weighed average)
NIOSH	0.05 mg / m^3	(10 hour time weighed average 40 hour work week)

Section 3 – Hazard Identification

This material is considered hazardous under the OSHA Hazard Communications Standards (29 CFR 1910.1200)

Potential Health Effects

Inhalation

Silicosis	Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability or death.
Lung Cancer	Crystalline silica (quartz) inhaled from occupational sources is classified as carcinogenic to humans.
Tuberculosis	Silicosis increases the risk of tuberculosis.
Autoimmune Diseases	There is evidence 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, Systemic Lupus Erythermatosus, Rheumatoid Arthritis, and diseases affecting the kidneys.
Nephrotoxicity	There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney disease, including end stage renal disease.
Eye Contact	Crystalline Silica (quartz) may cause abrasions to the cornea.
Skin Contact	May cause abrasion to the skin.
Ingestion	No known health effect.
Acute Effects	One form of silicosis, Acute Silicosis, can occur with exposure to very concentrations of respirable crystalline silica over a short period of time, 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.
Chronic Effects	The various forms of chronic effects of silicosis include lung cancer, autoimmune and chronic kidney diseases, tuberculosis and non-malignant respiratory disease.
Of Exposure	Generally, there are no signs or symptoms of exposure to crystalline silica (quartz).
Medical Conditions 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 the potential adverse health effects.

Section 4 – First Aid Measures

Inhalation	There is no specific treatment because the health effects associated with crystalline silica are chronic. If gross inhalation of crystalline silica occurs, remove the person to fresh air, perform artificial respiration as needed, and obtain medical attention as needed.
Eye	Do not allow the victim to rub eye(s). Let the eye(s) water naturally for a few minutes. Have victim look right and left, then up and down. If particle/dust is removed, while holding the eyelid(s) open. If irritation persists, obtain medical attention. DO NOT attempt to manually remove anything stuck to the eye(s).
Skin	Wash affected area thoroughly. If irritation persists, seek medical attention.
Ingestion	If large amounts ingested, seek attention immediately.

Good personal hygiene is essential. Always wash your hands after handling crystalline silica, prior to handling food and/or drinkable liquids.

Section 5 – Fire Fighting Measures

Flammability	None
Flashpoint	Not Combustible
Auto Ignition Temp	None
Lower Explosive Limit	None
Upper Explosive Limit	None
Explosion Habits	None
Extinguishing Media	Compatible with all media, use the medium appropriate to the surrounding fire.
Special Fire fighting Procedures	At extreme temperatures, calcium oxide fumes may evolve. Fire fighters must wear self-contained breathing apparatus (scuba) and full protective clothing.
Hazardous Combustion Products	None

Section 6 – Accidental Release Measures

Wear the appropriate personal protective equipment as described in Section 8 of this document. Collect the material using a method which does not produce dust (High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the silica). Place the silica in a covered container appropriately designed for disposal. Dispose of the silica according to federal, state, provincial and local regulations.

Extreme caution should be taken to avoid accidental release into waterways and/or sewer systems.

Section 7 – Handling and Storage

Handle material in such a manner as to reduce and/or minimize the dust, which can be created when handling crystalline silica. Use adequate ventilation and dust collection equipment. The proper personal protection equipment as described in section 8 of the document. Do not breathe the dust, which may be created during the handling of this product. Do not rely on vision to determine whether respirable silica is in the air, as it may be present without a visible dust cloud. Use good housekeeping procedures to prevent the accumulation of silica dust in the workplace.

Avoid breakage of bagged material or the accidental release of bulk material. Use dustless method (e.g. vacuum) during clean up. Do not dry sweep. Wet down spilled material if sweeping is the most feasible method of clean up.

The OSHA Hazard Communication Standard, 29 CFR sections 1910.1200, 1915.1200, 1917.28, 1926.59, and 1928.21, as well as state, provincial and local worker "right-to-know" laws and regulations should be strictly adhered to. WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS IN CASE OF RESALE) OF THE HAZARDS AND THE REQUIRED OSHA PRECAUTIONS. Provide the proper training to your employees in the safe handle and storage practices.

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 & Chemical Properties

Appearance	Light to Medium Brown	**Coefficient of Water /**	
Physical State	Solid Granular	**Oil Distribution**	Not Applicable
Odour Threshold	Not Applicable	**Vapour Density**	Not Applicable
Vapour Pressure	Not Applicable	**Specific Gravity**	2.6 (Approximate)
Evaporation Point	Not Applicable	**Melting Point**	4000°F (Approx 2,200°C)
Freezing Point	Not Applicable	**PH**	7.3

Section 10 – Stability & Reactivity

Stability	Stable
Materials to Avoid	Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride, and oxygen difluoride, may cause fires.
Hazardous Decomposition	Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.
Hazardous Polymerization	Will not occur.

Section 11 – Toxicological Information

The method of exposure to crystalline silica that can lead to the adverse health effects described below is inhalation.

Silicosis

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

Chronic or Ordinary Silicosis (often referred to as Simple 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, 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. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms if present are shortness of breath, wheezing, cough, and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor purmonale).

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; lung lesions can appear within 5 to 10 years of initial exposure. Progression may be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that lung lesions appear earlier and progression is more rapid. The disease continues to develop even after exposure stops, and is often associated with autoimmune disease, for example, scleroderma (a skin disease) involving thickening of the skin.

Acute Silicosis can occur with exposures to 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, and weight loss. Acute silicosis is fatal.

Cancer

IARC – The International Agency for Research on Cancer ("IARC") concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz and cristobalite." The overall IARC evaluation was the "crystalline silica inhaled in the form of quartz from occupational sources is *carcinogenic to humans (group 1)*." The IARC evaluation noted, "Carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs". For further information on the **IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans**, Volume 68, "silica, Some Silicates…" (1997).

OSHA – Crystalline silica (quartz) is not regulated by the U.S. Occupational Safety and Health Administration as a carcinogen.

Autoimmune Diseases
Several studies have reported excess cases of several autoimmune disorders, scleroderma, systemic lupus erythematosus, and rheumatoid arthritis among silica exposed workers.

Tuberculosis
Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis.

Kidney Disease
Several studies have reported excess cases of kidney diseases, including end stage renal disease, among silica exposed workers.

Non-Malignant Respiratory Diseases
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 dust generally (independent of the presence or absence of crystalline silica, or the level of crystalline silica in the dust).

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, or plant life.

Section 13 – Disposal Considerations

General
Crystalline silica may be land filled. Material should be placed in covered containers to minimize generation of airborne dust.

In the event the crystalline silica becomes contaminated, the material may require testing before it can be safely land filled. Review all Federal, provincial, state and local government requirements prior to disposal.

Section 14 – Transportation Information

Canadian Transportation of Dangerous Goods Regulations	Not Regulated
International Air Transportation Association (IATA)	Not Regulated
International Maritime Organization (IMO)	Not Regulated

Section 15 – Regulatory Information

CANADA

Domestic Substances List: Mill Creek Sand & Gravel (1980) Ltd. products, as naturally substances, are on the Canadian DSL

WHIMIS Classification: D – 2A

UNITED STATES (FEDERAL & 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 SS 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 SS 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 Peaskie Minerals was not processed with or does not contain any Class 1 or Class 2 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 SS175.300 (b) (3) (xxvi).

OTHER

Federal, provincial, state or local emergency planning, community right to know or other laws, regulations or ordinances may be applicable – consult applicable federal, provincial, state, or local new.

Section 16 – Other Information

Hazardous Material Information System (HMIS)

Health	*
Flammability	0
Reactivity	0
Protective Equipment	E

For further information on health effects, See section 3 and 11 of the MSDS

Prepared By **Mill Creek Sand & Gravel (1980) Ltd.**

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This MSDS Document supersedes all previous MSDS Documents distributed in whole or in part by Mill Creek Sand & Gravel (1980) Ltd. and/or its distributors. No alterations shall be made to this MSDS Document.

The data in this Material Safety Data Sheet (MSDS) related only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data that Mill Creek Sand & Gravel (1980) Ltd. believes reliable. It is intended for use by persons having technical skills and at their own discretion and risk. Since conditions of use are outside our control, we make no warranties, expressed or implied, and assume no liability in connection with any use of this information. Any use of this data and information must be determined by the user to be in accordance with Federal, Provincial and/or Municipal laws and regulations.