Material Safety Data Sheet
Silica Sand

Section 1 - Product Identification

Synonym : Silica Sand, Ground Silica and Fine Ground Silica Sand
Chemical Formula : SiO_2
Company Identification : Tradeasia International Pte. Limited
Address : 133 Cecil Street # 12-03 Keck Seng Tower, Singapore
Tel: +65-6227 6365
Fax: +65-6225 6286
Email: contact@chemtradeasia.com
Recommended use : brick, ceramics, foundry castings, glass, grout, hydraulic, fracturing sand, frac sand, proppant, mortar, paint and coatings, silicate chemistry, silicone, rubber, thermoset plastics.

Section 2 – Hazards Identification

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

2.2. Label elements
Symbols/Pictograms

Signal Word
Danger
Hazard Statements
H372: Causes damage to lungs through prolonged or repeated exposure by inhalation.
Precautionary Statements Storage
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
Not applicable

Section 3 – Composition/Information on Ingredients

3.1 Composition comments

Chemical Name	EC No/CAS No	Purity, %
SiO_2	14808-60-7	92.1-97.8
Al_2O_3	1344-28-1	2.01-5.7
Fe_2O_3	1309-37-1	0.07-0.16

Section 4 – First-Aid Measures

4.1. Description of first aid measures

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.

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. Suitable Extinguishing media

Use extinguishing media appropriate for surrounding fire.

5.2. Specific hazards arising from the chemical

Product is not flammable, combustible or explosive.

5.3. Special protective actions 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.

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.

Section 8 – Exposure Controls/Personal Protection

8.1. Appropriate engineering controls

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

8.2. Individual protection measures, such as personal protective equipment (PPE)

Eye/face 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.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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.

Section 9 – Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: granular, crushed or ground to a powder
Appearance: White or tan sand
Solubility in water: Insoluble
Odour threshold: Not determined
pH: 6-8
Specific Gravity: 2.65
Evaporation Rate: Not applicable
Flammability: Not applicable
Explosive limits: Not applicable
Decomposition Temperature: Not determined
Boiling Point: 4046°F/2230°C
Partition coefficient: Not applicable
Melting Point: 3110°F/1710°C
Vapor Pressure: Not applicable
Vapor Density: Not applicable
Flash Point: Not applicable
AUtoignition temperature: Not determined
Viscosity: Not applicable

Section 10 – Stability and Reactivity

10.1. Reactivity
Not reactive under normal conditions of use.

10.2. Chemical stability
Stable under normal temperatures and pressures.

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 Health effects associated with ingredients

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:

Major concerns:

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 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.

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)”. (As seen in IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C)

AUTOIMMUNE DISEASES

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

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.

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

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).

Acute toxicity
LD50 oral rat >22,500 mg/kg
Skin corrosion/irritation
Does not meet the criteria for classification.
Serious eye damage/eye irritation
Does not meet the criteria for classification.
Respiratory or skin sensitization
Does not meet the criteria for classification.
Germ cell mutagenicity
Does not meet the criteria for classification.
Carcinogenicity
See above.
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 hazard
Not an aspiration hazard

Section 12 – Ecological Information

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

12.2. Bioaccumulative potential
Silica is not bioaccumulative.

12.3. Mobility in soil
Silica is not mobile in soil.

12.4. Persistence and Degradability
Silica is not degradable.

12.5. Other adverse effects
Not available.

Section 13 – Disposal Considerations

13.1. Disposal 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. US DOT; CANADIAN TDG; EU ADR/RID; IMDG; IATA/ICAO
Not regulated

Section 15 – Regulatory Information

15.1. Safety, health and environmental regulations
Taiwan: Silica is listed on the CSNN inventory or exempt from notification requirements.
US EPA TSCA Inventory: All of the components of this product are listed on the EPA TSCA inventory.
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.
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.

Section 16 : Additional Information

16.1. List of abbreviation and acronyms used in this MSDS
SDS : Safety Data Sheets
Index N° : atomic number of the element most characteristic of the properties of the substance

CAS No : Chemical Abstracts Service number
EC No : EINECS Number : European Inventory of Existing Commercial Substances
Repr. Cat. 2 : Substance presumed human reproductive toxicant
Acute Oral Cat. 5 : Substance which is of relatively low acute oral toxicity.
GHS : Globally Harmonised System of Classification and Labelling
LD_{50} : Median Lethal Dose
LC_{50} : Lethal Concentration, 50%
N.A. : Not Applicable
OSHA : Occupational Safety & Health Administration
Cal OSHA : The State of California Division of Occupational Safety and Health (DOSH)
PEL : Permissible Exposure Limits
ACGIH : American Conference of Governmental Industrial Hygienists
TLV : Threshold Limit Value
Japanese MITI : Japanese Ministry of International Trade and Industry
EC_{50} : Half maximal effective concentration
UN : United Nations
U.S. EPA TSCA Inventory: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the autority of the Environmental Protection Agency
Canadian DSL: Canadian Domestic Substances List

16.2. List of relevant hazard statements and precautionary statements used in this MSDS
Hazard Statement
H372: Causes damage to lungs through prolonged or repeated exposure by inhalation
Precautionary Statements
Prevention
P260: Do not breathe dust.
P285: In case of inadequate ventilation wear respiratory protection.
Disposal
P501: Dispose of contents/containers in accordance with local regulations.

16.3. References
1. NIOSH Hazard Review - Occupational Effects of Occupational Exposure to Respirable Crystalline Silica published in April 2002.
2. Kidney Disease and Silicosis, Nephron, Volume 85, pp. 14-19 (2000).
3. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C,"A Review of Human Carcinogens: Arsenic, Metals, Fibres and Dusts " (2011).

16.4. Disclaimer of Liability
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