

Safety Data Sheet

SILICA SAND

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Name: Silica Sand
Synonyms: tridymite, white sand, quartz sand
Recommended Use and Restrictions on Use:
(Powder)
raw material of glass, water glass, ceramic industry, polisher, water filtering, microsphere, concrete ingredient, source of ferro silica, Si element, filler of cosmetics, pharmaceutical, paper, and pesticide, hydrate and precipitation as rubber reinforcing agent including silicone rubber, anti-caking agent of food, flattening agent of paint, heat insulator.
(Melt)
melted waste of a rocket engine and a space ship, fiber for reinforcing plastic, and lens of special cameras.
(Non-crystalline)
silica gel
Supplier: Chin Ching Silica Sand Co., Ltd.
Address: 11F, 315, Sung Kiang Rd., Taipei City 104, Taiwan (R.O.C.)
Telephone: +886-2-25061136
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SECTION 2 - HAZARDS IDENTIFICATION

Hazard Classification: Category 1 carcinogen ingredients, a specific target organ toxicity – repeated exposure to the system level 2

Pictogram: Health Hazard



Signal Word: Hazard

Hazard Statement: May cause cancer. Long term or repeated exposure may cause organ damage

Precautionary Statements: Set the container in a well-ventilated place. Do not breathe dust. Wear protection goggles and protective dust masks. Use only in a well-ventilated place.

Other Hazards: -

SECTION 3 – THE INGREDIENTS IDENTIFICATION DATA

Pure substances

Material Name: Silicon dioxide

Synonyms: Silica, Crystalline silica, tridymite (tridimite), Christensenite, crystalline silicon dioxide, free crystalline silica, alpha-tridymite.

CAS Registry Number (CAS No.): 15468-32-3

Ingredients of Hazardous Substances (percentage): 100%

SECTION 4 - FIRST AID MEASURES

First Aid of Different Routes of Exposure:

Inhalation:

1. As the material is potentially carcinogen, self protection should be taken to ensure personal safety before doing first aid measures.
2. Remove sources of pollution or the affected person to fresh air.
3. Seek medical advice/attention immediately.

Skin Contact:

If a sense of irritation, rinse gently with slow water for 5 minutes till dust is removed.

Eye Contact:

1. Rubbing eyes by the affected person is prohibited. Make the eyes weep naturally for a few minutes.
2. Ask the affected person to look from up to down and from left to right. If dust is not yet removed, maintain the eyelids open and rinse gently with slow water for 5 minutes till dust is removed.
3. If a sense of irritation persists after rinsing and washing, get medical advice/attention immediately.
4. Do not remove dust by hands.

Ingestion:

Ingestion of the material does not damage health. But if any feeling of uncomfortableness or irritation, immediately get medical advice/attention.

The Most Important Symptoms and Damage Effect:

When the solid material in the eyes gets wet by tears, it may cause tears, blurred vision and mild temporary pain.

Personnel Protection Equipments for First Aid Responder:

Wear level-c protective equipments when doing first aid in the safe area.

Doctor Tips:-

SECTION 5 - FIRE FIGHTING MEASURES

Extinguishing Media: The material is incombustible. Use suitable fire extinguishers to isolate the scene of a fire.

Specific Hazards Arising from the Chemical upon Fire Fighting: -

Special Fire Fighting Procedure: Cool the tanks or containers exposed to the scene of a fire by water spray.

Special Protective Equipments for Fire Fighters:-

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Notice:

1. Enforce access control until the leakage area is fully cleaned up.
2. Ensure that the clean-up task is performed by trained personnel.
3. Wear proper personal protective equipments.

Environmental Notice: Execute ventilation and air exchange of such area.

Cleaning Methods:

1. Do not drily sweep.
2. If possible, spray water to avoid dust flying or use vacuum equipments with HEPA filters to clean.

SECTION 7 - HANDLING AND STORAGE

Disposal:

1. The material is hypertoxic solid. (potentially carcinogen and hazardous if long term inhalation of the material) Engineering control should be enforced and personal protective equipments should be well used. Staff personnel should be properly trained with knowledge of the hazard and the safe use of the material.
2. If there is any leakage or bad ventilation, present to the superior immediately.
3. Take into consideration to use a enclosed operation system or wet mode operation.
4. Avoid leakage of dust in the air in the working field. Use and operate in the appointed well-ventilated area in minimum amount of use. The operation area and storage area should be located apart.
5. Use a proper tool to open the container. Leakage may result from uneven rips when the container is opened too quickly.
6. Stay windward when opening, formulating or mixing the material.
7. Keep the container enclosed when it is not used.
8. Maintain internal environment management and avoid accumulation of dust on the floor, wall, at the corners, or in the equipments.
9. Do not drily sweep. Make the floor wet before sweeping or use vacuum equipments with high-efficiency filters.
10. Do not use the material together with the incompatibles such as strong oxidizer.
11. Ensure sufficient and helpful emergency facilities in the storage area and operation area.

Storage:

1. Storage amount should be limited.
2. Clear warning notice should be posted in the storage area that no barriers and that only designated or trained personnel are permitted to enter.
3. Inspect breakage or leakage regularly.
4. Warning notice should be posted in a proper position.
5. The material should be stored in a proper and marked container. Keep the container enclosed and from damage when not using it.
6. Inspect to ensure all new containers with proper marks and without damages.
7. Keep the material away from the incompatibles such as strong oxidizer.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Control:

1. Owing to high potential hazards of the material, an enclosed or isolated environment may be required during the production process.
2. Specific ventilation arrangement is required to make control of silica sand (Reference:

Industrial Ventilation: A Manual of Recommended Practice by ACGIH)

Control Parameter:

Time Weighted Average (8 hours/ day): TWA

Short Term Exposure Limit: STEL

Ceiling: CEILING

Biological Exposure Indices: BEIs

Personal Protective Equipments:

Respiratory Protection:

1. Below 0.5mg/m³: A respirator with high-efficiency filters.
2. Below 1.25mg/m³: A Powered air-purifying respiratory with high-efficiency filters or an air-supplied respirator in which an alternative supply of fresh air is delivered.
3. Below 2.5mg/m³: A full face respirator with high-efficiency filters or a closed-circuit type mask and a powered air-purifying respirator with high-efficiency filters.
4. Below 25mg/m³: A positive pressure air-supplied respirator.
5. Unknown concentration or IDLH: A positive pressure full-faced respirator (a self-contained breathing apparatus or SCBA) or a positive pressure full-faced air supplied respiratory protector together with an auxiliary positive pressure respirators (self-contained breathing apparatus or SCBA)
6. Escape: A full-faced respiratory protection with high-efficiency filters or an escape breathing apparatus (self-contained breathing apparatus or SCBA).

Hand Protection: No specific requirements. Avoid direct contact with skin.

Eye Protection: Dust proof safety goggles

Skin and Body Protection: No specific requirements. Avoid direct contact with skin.

Health Measures:

1. Take off the contaminated clothing as soon as possible after work. Reuse or abandon the contaminated clothing only after laundry. The laundry person should be advised of the hazards of the contamination.
2. No smoking or food/drink in the work place.
3. Wash hands thoroughly after use or operation of the material.
4. Maintain the cleanness of the work place.

SECTION 9 - PHYSICAL & CHEMICAL PROPERTIES

Appearance: Transparent or white odorless crystal-shaped solid

Odor: Odorless

Odor threshold: Odorless

Melting Point: 1703 °C

PH value:-

Boiling Point/Boiling Range: 2,230 °C

Flammability (solid, gas):-

Flash Point: Noncombustible

Test Method: decomposition temperature: /

Autoignition Temperature:/

Explosive Limits:/

Vapor Pressure: ~0 mmHg @20°C

Vapor Density: /

Density: 2.26 (density of water=1)

Solubility: insoluble in water.

Partition Coefficient of Octanol/water (log Kow):/

Volatility Rate:/

SECTION 10 - STABILITY AND REACTIVITY

Stability: Being stable under normal circumstances.

Possible Hazardous Reaction under Specific Circumstances:

1. **Strong oxidant (such as fluorine, chlorine trifluoride, fluoride oxide):** fierce reaction may take place, and cause an explosion and fire.
2. **Hydrofluoric acid:** erosion of Quartz.
3. **Magnesium:** Heating the mixture of moist quartz and magnesium powder causes fierce explosions.
4. **Manganese Trifluoride:** may cause intense reaction.
5. **Sodium:** silica sand reacts with burning sodium.
6. **Xenon fluoride (XeF₆):** may form explosive properties, oxidizing Xenon (XeO₃)

Conditions should be avoided: producing dust

Substances should be avoided: strong oxidant (such as fluorine, chlorine trifluoride, and fluoride oxide), hydrofluoric acid, magnesium, manganese trifluoride, sodium, Xenon fluoride (XeF₆): may form explosive properties, oxidizing Xenon (XeO₃).

Hazardous decomposition: none

SECTION 11 - TOXICOLOGICAL INFORMATION

Routes of Exposure: skin contact, inhalation, ingestion, and eye contact.

Symptoms: cough and mild respiratory tract irritation.

Acute toxicity:

Skin Contact: tridymite generally does not irritate skin.

Inhalation: high concentrations of dust may cause coughing and mild temporary stimulus.

Ingestion: not toxic.

Eye Contact: generally dust does not stimulate eyes except the effect of "foreign body" in the eyes. When the solid material in the eyes gets wet by tears, it may cause tears, blurred vision and mild temporary pain.

LD50 (test animals, the way of absorption):-

LC50 (test animals, the way of absorption):-

Chronic or Long-term Toxicity:

1. Inhalation: chronic and repeated exposure to crystalline silica dust may cause severe lung scarring, named silicosis.
2. The risk of accelerated Silicosis is determined by the concentration of fine respirable silica dust and time of exposure.
3. The particle size of the dust less than 1 µm in diameter is deemed to result in the highest risk.
4. Silicosis is developed chronically 20 years or more.
5. Single exposure to tridymite in occupational circumstances is rare as tridymite exists in pollutant of nature silica or the byproduct of compound silica.
6. Some reports reveal tridymite results in severer lung damage than quartz.

7. The early symptoms of silicosis include, but not limited to, cough, mucus secretion, shortness of breath, and any symptoms not being found until they develop to be or even severer disease. Even if stopping exposure to crystalline silica, silicosis may still develop continuously. Silicosis usually can be found by x-ray examination.
8. Silicosis can progress rapidly from simple to severe. With simple symptoms, although lung damage is proved by x-ray, no typical and significant respiratory damage is found.
9. With severe symptoms, it can develop significant and gradual respiratory damage. If no efficacious treatments, it may shorten the life span expectedly depending on the severity. Silicosis may result in heart failure that the heart hardly pumps blood through the lung scarring tissue, causing death.
10. Silicosis may become more complicated along with bacteria infection including tuberculosis.
11. Exposure to high concentration of crystalline silica for 5-10 years causes accelerated silicosis.
12. Even if the exposure stops, the disease continuously develops and relates to autoimmune diseases such as sclerema.
13. Acute silicosis rarely causes to human beings, however, it does if exposure to high concentration of crystalline silica dust within quite short time (1-2 years). For example, it happens to occupations with less exposure control including sandblasting and tunnel digging. Acute silicosis may cause death within years and is often accompanied with a complication of tuberculosis.
14. Tridymite is potentially carcinogenic.
15. Tridymite is proved carcinogenic by animal tests, while two other forms of crystalline silica carcinogenic to human beings are quartz and white silica causing lung cancer. Different forms of crystalline silica have different potential carcinogenicity. However, no specific data denies the carcinogenicity of tridymite, and thus it is regarded as potentially carcinogenic.

SECTION 12 - ECOLOGICAL INFORMATION

Ecological toxicity: LC50 (fish):-

EC50 (aquatic invertebrates): -

Bio-Concentration Factor (BCF):-

The Persistence and Degradability:

1. The particles inhaled may deposit in different parts of respiratory track based on the shape, mass, pneumatics and other physical properties of the particles. Most of the particles inhaled will deposit in the lung and be exhaled for years after exposure stops.
2. Silicon will be slightly absorbed by human bodies and the silicon absorbed mainly deposits in the lymph nodes of partial liver and spleen.
3. Silicic acid absorbed by human body can be egested by diabetes.

half-life (air):-

half-life (surface water):-

half-life (groundwater):-

half-life (soil):-

Bioaccumulation:-

The Mobility in Soil:-

Other Adverse Effects:-

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Refer to applicable laws and regulations.

SECTION 14 - TRANSPORT INFORMATION

UN Number:-

UN Shipping Name:-

Transport Hazard class(es):-

Packing Group Number:-

Marine Pollutant (yes/no):-

Special Delivery Methods and Points for Attention: -

SECTION 15 - REGULATORY INFORMATION

Applicable Laws and Regulations:

1. Regulation of Labeling and Hazard Communication of Dangerous and Harmful Materials
2. Road traffic safety regulations
3. Methods and Facilities Standards for the Storage, Clearance and Disposal of Industrial Waste.

SECTION 16 - OTHER INFORMATION

References:

1. CHEMINFO database, CCINFO CD, 2005-3
2. RTECS database, TOMES PLUS CD, Vol.65, 2005
3. ChemWatch database, 2005-1
4. Chinese database of hazardous chemical substances of Environmental Protection Administration Executive Yuan, R.O.C. (Taiwan).

The MSDS is issued by:

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The MSDS is made by:

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Date: Jul. 19, 2017

*Note:

1. In the above data sheet, the symbol "-" represents at present no relevant data is available, and the symbol "/" represents the field does not apply to the material.
2. The data and information in the above data sheet is for reference only and users/operators should judge the applicability depending on practical practices or needs. Note especially the possible and various hazards caused by mixing the material with the others. Safe and health advise should be given to the laborers in accordance with Regulation of Labeling and Hazard Communication of Dangerous and Harmful Materials

---END OF MSDS---