Safety Data Sheet
Silica Nanoparticle Powder

1. PRODUCT AND COMPANY IDENTIFICATION


COMMON SYNONYMS: Silicon Dioxide, silica, colloidal silica, amorphous silica, (sand is predominantly silicon dioxide), fused silica, fuselex, microcrystalline quartz

CHEMICAL FAMILY: Silicon Compounds

FORMULA: SiO₂

Identified uses: Laboratory chemical, Manufacture of substances

Supplier: General Engineering & Research, L.L.C.
10459 Roselle St. Ste. A
San Diego, CA 92121-1527

Information: 858-291-8336

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
OSHA Hazards: Inhalation of mist or dust may be harmful. Avoid repeated or prolonged breathing of spray mist or dust.

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Specific target organ toxicity – repeated exposure (Category 1), H372
For the full text of the H-Statement mentioned in the Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H372 Causes damage to organs through prolonged or repeated exposure.

Precautionary statement(s)
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Get medical advice/attention if you feel unwell.
Dispose of contents/container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances
Formula: $O_2Si$
Molecular weight: 60.08 g/mol
Cas-No.: 7631-86-9

Appearance
Form Powder
Colour white, off-white, or yellow
Odour none

Hazardous Component Classification Concentration
Silicon dioxide (amorphous) STOT RE 1: H372 <=100.0%

For the full text of H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.
Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in Section 2.

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Silicon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

Handling
Use only well ventilated areas. Avoid contact with eyes. Avoid contact with skin, inhalation and ingestion. Avoid breathing vapor. Avoid breathing dust. Keep from freezing. Keep away from children.

Storage
Storage conditions: Keep container tightly closed in a dry and well-ventilated place. Storage class (TRGS 510): Non Combustible Solids

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits(s)

Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon dioxide</td>
<td>7631-86-9</td>
<td>TWA</td>
<td>6.0 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>20.0 Million particles per cubic foot</td>
<td>USA. Occupational Exposure Limits (OSHA) – Table Z-3 Mineral Dusts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>80.0 mg/m3 / % SiO2</td>
<td>USA. Occupational Exposure Limits (OSHA) – Table Z-3 Mineral Dusts</td>
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</tbody>
</table>

Millions of particles per cubic foot of air, based on impinge samples counted by light-field techniques. mppcf X 35.3 = million particles per cubic meter = particles per c.c.

Eye protection: Goggles

Hand protection: Nitrile rubber gloves. Other chemical resistant gloves may be recommended by your safety professional.

Skin and body protection: Normal work wear.

Respiratory protection: No personal respiratory protective equipment normally required. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

Engineering measures: Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES
Appearance

Form          powder
Colour        white
Odour         none
Flash point   not applicable

Component: Silica

Relative vapour density  Heavier than air.
Water solubility         partly soluble
Relative density         2.1 – 2.3
Melting point/freezing point  1,600 - 1,725 °C (2,912 - 3,137 °F)
Initial boiling point and boiling range  2,230 °C (4,046 °F)

Note: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions  Stable under normal conditions
Conditions to avoid  Extreme heat, freezing temperatures
Materials to avoid    strong oxidizers
Hazardous decomposition  oxides of silicon, irritating fumes, acidic fumes
Products
Polymerization      Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Component: Silica

Acute oral toxicity  LD50 rat > 3,000 mg/kg

Inhalation: No data available
Dermal: No data available
Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Carcinogenicity
Carcinogenicity - Rat – Inhalation

Tumorigenic: Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors.

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Silicon dioxide)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available
The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Aspiration hazard
No data available

Additional Information
RTECS: Not available
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

13. DISPOSAL CONSIDERATIONS

Environmental precautions: Prevent the material from entering drains or water courses. Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Disposal
Dispose in accordance with all local, state (provincial), and federal regulations. Under RCRA, it is the responsibility of the product's user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because the product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.
Do not remove label until container is thoroughly cleaned. Empty containers may contain hazardous residues. This material and its container must be disposed of in a safe way.

14. TRANSPORT INFORMATION

DOT
Not regulated for transport

IMO/ IMDG/ IATA
Not regulated (Not dangerous for transport)

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.

15. REGULATORY INFORMATION

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Immediate health hazard

SARA TITLE III: Section 313 Information (40CFR372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.
US. Toxic Substances Control Act (TSCA) All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)
This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.
H372 Causes damage to organs through prolonged or repeated exposure.
STOT RE Specific target organ toxicity – repeated exposure

<table>
<thead>
<tr>
<th>Hazard Rating</th>
<th>Health</th>
<th>Chronic Health Hazard</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS Rating</td>
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<td>*</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NFPA Rating</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Legend
ACGIH American Conference of Governmental Industrial Hygienists
OSHA Occupational Safety and Health Administration
PEL Permissible Exposure Limit
STEL Short Term Exposure Limit
TLV Threshold Limit Value
TWA Time Weighted Average

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transporation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.