

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	Fused silica TECO-SPHERE / Spherical Silica/TS/ TS-M/TS-C		
FORMULA:	SiO ₂		
SUPPLIER:	C-E Minerals	MANUFACTURER:	C-E Minerals
ADDRESS:	901 E. Eighth Avenue King of Prussia, PA 19406	ADDRESS:	P.O. Box 1540 Snapp Ferry Road Greeneville, TN 37743
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DESCRIPTION:	TECO-SPHERE TS/TS-M/TS-C is a fused silica containing greater than 95% non-crystalline silica and less than 5% crystalline silica.		

2. INGREDIENTS: COMPOSITION/INFORMATION

INGREDIENT	% WEIGHT	PEL-OSHA	TLV-ACGIH	LD 50/LC 50 ROUTE/SPECIES
Fused Silica (Amorphous) CAS No.: 60676-86-0 RTECS No.: VV7328000	> 95	None Established	0.1 mg/m ³ (resp.)	LDLo: 120 mg/kg intratracheal/rat
Quartz CAS No.: 14808-60-7 RTECS No.: SO5600000VV7325000	< 5.0	[10 mg/m ³ / (%SiO ₂ + 2)](resp.) [30 mg/m ³ / (% SiO ₂ + 2)] (total)	0.025 mg/m ³ (resp.)	No Data

OSHA Regulatory Status: This material is classified hazardous under OSHA regulations.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Non-flammable gray to white powder. Inhalation of high concentrations may cause upper respiratory irritation. This product contains crystalline silica (< 5% quartz). Once inhaled, cristobalite can remain in the lungs causing scarring, stiffening and difficulty breathing. The most common type of silicosis develops following repeated inhalation over time; however, inhalation of high dust concentrations may cause short-term (acute) silicosis. Repeated inhalation of crystalline silica can also increase the risks of developing respiratory cancer. Animal studies indicate that fused silica may cause lung fibrosis. Avoid dust creation. Do not inhale dusts from this product. Do not use compressed air or dry sweeping to remove dusts from the work area. Use an appropriately equipped vacuum wet clean-up methods to remove dusts.

POTENTIAL HEALTH EFFECTS

EYE: None anticipated.

SKIN: None anticipated.

INGESTION: Practically non-toxic. Ingestion is not anticipated under normal working conditions.

INHALATION: Inhalation may cause respiratory irritation and coughing. Exposures to very high concentrations of crystalline silica in a short period of time have on rare occasions been reported to cause acute or rapidly-developing silicosis. Acute silicosis can develop 1-2 months following exposure and has caused severe respiratory symptoms and death.

SIGNS AND SYMPTOMS: Symptoms of silicosis include phlegm, coughing, and characteristic x-rays. The damaged lungs will become increasingly less able to provide the body with oxygen causing tiredness, shortness of breath, decreased capacity to work, and can result in death by cardiac failure or by the destruction of lung tissue. Shortness of breath upon exertion is one of the most common symptoms of silicosis and limited chest expansion is the most common physical sign.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Long-term dust exposure may aggravate pre-existing respiratory disease. Persons who develop silicosis have greatly increased risks of developing tuberculosis and workers who are exposed to crystalline silica and smoke have increased risks of lung damage.

CHRONIC: Repeated inhalation of respirable crystalline silica over a number of years can cause lung disease (silicosis) and increase the risks of developing respiratory cancer. Silicosis is a progressive fibrotic pneumoconiosis which greatly decreases the ability of the lungs to provide oxygen (decreased pulmonary capacity). The disease may progress even if the worker is removed from exposure. The extent and severity of lung injury depends on a variety of factors including particle size, percentage of silica, natural resistance, dust concentration and length of exposure.

Studies indicate that fused silica may have a fibrogenic potential similar to but slightly less than that of quartz.

TARGET ORGANS: Lungs

CARCINOGENICITY: NTP: Yes IARC: Yes (Group 1) OSHA: Yes

IARC and NTP classify respirable crystalline silica as a confirmed or known human carcinogen. Although OSHA has not promulgated a specific standard for crystalline silica, materials that contain $\geq 0.1\%$ crystalline silica should be treated as a confirmed carcinogen for hazard communication purposes (29 CFR 1910.1200).

4. FIRST AID MEASURES

EYE: Flush eyes with lukewarm water for 15 minutes opening and closing eyelids to ensure adequate rinsing. If redness, irritation, pain, or tearing persists, seek medical attention.

SKIN: Exposure not anticipated.

INHALATION: Immediate effects are not anticipated. If large amounts of dusts are inhaled, remove to fresh air. If breathing problems occur, a certified professional should administer oxygen or CPR if indicated. Seek immediate medical attention.

4. FIRST AID MEASURES (continued)

INGESTION: None required.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: Not Applicable

FLAMMABLE LIMITS: LEL: Not Applicable UEL: Not Applicable

NFPA CLASSIFICATION:

HEALTH: 0

FLAMMABILITY: 0

INSTABILITY: 0

EXTINGUISHING MEDIA: Any. Use media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARDS: Non-flammable, non-combustible. Product will not burn.

HAZARDOUS DECOMPOSITION PRODUCTS: None known. Fused silica and quartz may convert to cristobalite at high temperatures.

FIRE FIGHTING INSTRUCTIONS: Firefighters should wear a NIOSH approved full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or bunker gear.

6. ACCIDENTAL RELEASE MEASURES

Isolate hazard area and deny entry to unauthorized and/or unprotected personnel. Do not walk through or otherwise scatter spilled material. For small spills, clean with a vacuum with a filtration system sufficient to remove and prevent recirculation of fused and crystalline silica (a vacuum equipped with a high-efficiency particulate air (HEPA) filter is sufficient). For large spills, use a fine spray or mist to control dust creation and carefully scoop or shovel into clean dry container for later reuse or disposal. **DO NOT USE DRY SWEEPING OR COMPRESSED AIR TO CLEAN SPILLS.** Appropriate protective equipment including respiratory protection is essential for all clean-up personnel (See Section 8). Completely remove dusts to prevent recirculation of crystalline silica.

7. HANDLING AND STORAGE

Store in dry area in closed containers. Storage and work areas should be periodically cleaned to minimize dust accumulation. Avoid dust inhalation and promulgation. **DO NOT** use compressed air or dry sweeping to remove dust from work area. Dusts should be removed using an appropriately equipped vacuum. If an appropriate vacuum is unavailable, only wet-clean-up methods should be used (i.e. misting). Moisture should be added as necessary to reduce exposure to airborne respirable dusts.

Under dusty conditions, employees should wear coveralls or other suitable work clothing. Contaminated clothing must be vacuumed before removal. **DO NOT REMOVE** dusts from clothing by blowing or shaking.

Practice good housekeeping. Wash thoroughly after handling. Change contaminated clothing. Do not reuse until laundered. Do not take silica contaminated clothing home.

7. HANDLING AND STORAGE (continued)

Comply with OSHA Hazard Communication Rule 29 CFR 1910.1200, and applicable federal, state, and local worker or community "right-to-know" laws and regulations during storage, use, and disposal of this product. For further information, consult the American Society for Testing and Materials (ASTM) standard practice ASTM E 1132 Revision 99A, "Standard Practice for Health Requirements Relating to Occupational Exposure to Crystalline Silica".

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY: Under normal working conditions, below acceptable exposure guidelines, none is required. Appropriate respirator selection is dependent upon the magnitude of exposure and must be selected in accordance with 29 CFR 1910.134. For air concentrations above the PEL to 2.5 mg/m³ crystalline silica, a NIOSH approved full facepiece air-purifying respirator with a HEPA filter or powered air-purifying respirator with a tight-fitting facepiece and HEPA filter may be worn.

SKIN: None required.

EYES: Safety-glasses with side shields or goggles to prevent dust and particles from entering the eye.

ENGINEERING CONTROLS: Enclosed processes used in combination with local exhaust ventilation as necessary to control air contaminants at or below acceptable exposure guidelines. Local exhaust ventilation and collection systems must be designed and maintained to prevent the accumulation and recirculation of respirable silica into the workplace.

OTHER: Where there is a potential exposure to free silica, the following warnings should be readily visible and posted near entrances or accessways to work areas: **WARNING! FREE SILICA WORK AREA.** Unauthorized persons keep out. The following warning should be posted within the work area where potential exposure may occur: **WARNING! FREE SILICA WORK AREA.** Avoid Breathing Dust. May Cause Delayed Lung Injury (silicosis). (NIOSH Criteria Document, Occupational Exposure to Crystalline Silica, pg. 5, 1974)

Medical surveillance program in accordance with "Criteria for a Recommended Standard. . . Occupational Exposure to Crystalline Silica", NIOSH, pp.: 2-4, 1974.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	White to gray powder
ODOR:	Odorless
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY (H₂O = 1):	2.2
MELTING POINT:	+ 3000 °F (+1650 °C)
pH (10% slurry):	4.5-7
% VOLATILE	0
TYPES:	Available only as a powder

10. STABILITY AND REACTIVITY

STABILITY: Stable

REACTIVITY/INCOMPATIBILITY: Silica is incompatible with strong oxidizers (i.e.: fluorine, oxygen difluoride, and chlorine trifluoride).

DECOMPOSITION PRODUCTS: At high temperatures fused silica and quartz may form cristobalite.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

EYE: Particulate matter may cause physical injury to the eye.

SKIN: Skin irritation is not anticipated.

INHALATION: Acute silicosis has been reported for exposure to extremely high crystalline silica concentrations particularly when the particle size of the dust is very small. Acute silicosis is rapidly progressive with diffuse pulmonary involvement and does not form classical silicotic nodules. The disease is often complicated by tuberculosis and can develop only months after the initial exposure with the possibility of death within 1 or 2 years. This product contains < 5% crystalline silica. Acute silicosis may not occur at the concentrations present.

INGESTION: Product is relatively non-toxic if ingested.

CHRONIC: Classic silicosis is characterized by the formation of scattered silica containing nodules of scar tissue in the lungs ranging in size from microscopic to greater than 1 cm. Simple silicosis (nodules < 1 cm) is generally asymptomatic but may progress to debilitating complicated silicosis (nodules > 1 cm) with or without continued exposure. Historically, workers who developed silicosis had greatly increased risks of developing an accompanying tuberculosis infection (silicotuberculosis). Fifty years ago, tuberculosis accounted for 75% of the deaths among silicotic workers.

IARC has found inadequate evidence to link exposure to amorphous silica to cancer in animals.

Limited data is available concerning the health effects of fused silica in animals or humans; however, animal studies indicate a fibrogenic potential less than that of quartz. IARC has found inadequate evidence to link exposure to amorphous silica to cancer in animals.

SUBCHRONIC: No Data

OTHER: Silica particles < 10µm are considered respirable; however, particles retained in the lungs are generally much smaller. Silica particles retained in the human lung have median diameters of 0.5-0.7 µm.

12. ECOLOGICAL INFORMATION

Fused Silica TECO-SPHERE/TS/TS-M/TS-C is an inert material. It does not contain ozone depleting substances and is not expected to exert an ecotoxic effect or bioconcentrate in the food chain.

13. DISPOSAL CONSIDERATIONS

Dispose of according to applicable federal, state, and local regulations. Dispose per 40 CFR 261 and 262.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT): Not Classified

15. REGULATORY INFORMATION

CANADIAN WHMIS: D2A, D2B

EPCRA Section 302 (EHSs): This product does not contain ingredients subject to reporting requirements of 40 CFR Part 355, Appendices A and B (Extremely Hazardous Substances).

CERCLA, Section 304: This product does not contain ingredients subject to state and local reporting under Section 304 of SARA Title III as listed in 40 CFR Part 302, Table 302.4

SARA 313 REPORTING REQUIREMENTS: This product does not contain ingredients subject to the reporting requirements of Section 313 SARA, and Section 6607 of the Pollution Prevention Act:

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and by definition meets the requirements of the following category:
Chronic Health Hazard

CALIFORNIA PROPOSITION 65: This product contains crystalline silica, an ingredient known to the State of California to cause cancer.

TSCA (Toxic Substances Control Act): All ingredients contained in this product are on the TSCA inventory.

16. OTHER INFORMATION

Revision Date: 3/1/99 – New Product Process for Spherical Silica
10/17/00 – reissued with no change.
8/15/03 - Health and Safety update
9/08/03 Added TS, TS-M, TS-C

KEY:

ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service
(C): Ceiling Limit
DOT: Department of Transportation
IARC: International Agency for Research on Cancer
MSHA: Mine Safety and Health Administration
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
SARA: Superfund Amendment and Reauthorization Act
TLV: Threshold Limit Value

DISCLAIMER

Although reasonable care has been taken in the preparation of the information contained herein, C-E Minerals extends no warranties, makes no representation and assumes no responsibility as to the accuracy of suitability of such information for application to purchaser's intended purposes or for consequences of its use.