

Fact Sheet: “Silicon Tetrachloride”



What is “Silicon Tetrachloride”?

Silicon Tetrachloride is a chemical compound made up of silicon and chlorine. It is a by-product of the process used by Hemlock Semiconductor Operations in the manufacture of polycrystalline silicon metal for the semiconductor and solar cell industries. It is recovered and converted to Trichlorosilane, the primary raw material in the process.

Silicon Tetrachloride is also sold directly to semiconductor, fiber optic cable and other customers for use in their processes.

Silicon Tetrachloride is a colorless liquid, but if accidentally released to the atmosphere, it may form a visible, fog-like cloud. Silicon Tetrachloride reacts with water, including moisture in the air, to form Hydrogen Chloride or hydrochloric acid and a white residue of SiO₂ or silica (a component of common sand). This residue may become deposited on vegetation, houses, vehicles and other objects downwind of the release point.

Pure Silicon Tetrachloride is non-flammable.

Silicon Tetrachloride and the reaction by-product, Hydrogen Chloride, have a sharp disagreeable odor, even at low concentrations.

Effects of exposure & first aid

The effects listed below are possible effects of exposure to Silicon Tetrachloride. The actual effects will depend on the duration of exposure, the severity of exposure (concentration) and the particular individual (e.g., age, physical condition, etc.).

	Possible effects	What to do
Eyes	Irritation; slight to severe pain and watering; slight to severe burns	Hold eyes open and immediately flush with cool or lukewarm water for 15 minutes. Seek immediate medical attention.
Skin	Slight irritation to severe burns	Immediately flush skin with cool or lukewarm water for 15 minutes, seek immediate medical attention.
Inhalation	Slight irritation to severe burns to the respiratory tract	Seek fresh air and immediate medical attention.
Oral	Slight irritation to severe burns to the mouth and/or throat	Seek immediate medical attention. Do not induce vomiting.

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Shelter-in-place procedures

In case of an airborne release of Silicon Tetrachloride, individuals should follow “shelter-in-place” procedures outlined below. Properly followed, these procedures safely protect people and animals until the hazard has passed.

1. Take shelter inside the nearest building.
2. Close and securely latch all doors and windows.
3. Turn off all fans, air conditioners, furnaces and pilot lights.
4. Put out fires in fireplaces or wood stoves. Close all dampers.
5. Go to an interior room located on the ground or upper level. Do not go to basement areas (vapors are heavier than air). Use duct tape, plastic sheeting, or towels to seal doors and windows.
6. If you are in a vehicle, safely stop the vehicle and shut off the engine. Close all doors, windows and vents and turn off the fan.
7. Stay inside and wait for the “all clear”. Listen to local television or radio for further instructions.

After the “All Clear”

People who experience any irritation or other medical problems as a result of exposure should seek immediate medical attention.

People, including children, and pets can go outside. As a precaution, normal bathing with soap and water is recommended.

Building windows, dampers and vents should be opened to air out the building. Heating or air conditioning systems can be safely used.

Fruits and vegetables from gardens should be washed thoroughly before eating.

Trees shrubs and lawns near the release may eventually discolor or show other effects of exposure. Thorough rinsing of exposed surfaces with water may minimize these effects.

Rivers, streams, ponds and swimming pools should be unaffected.

More information?

Contact Hemlock Semiconductor Operations with any questions or concerns. Ask for VP Manufacturing, VP Engagement & Advocacy, or EHSS Manager.

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