## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**1.1 Product identifier**

| | |
|---|---|
| Product Number: | PROSILANE™ SC-5420HP |
| Chemical name: | TETRAETHYL ORTHOSILICATE [PURITY ≥99.5%] |
| CAS No.: | 78-10-4 |

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Used to produce silicon dioxide films, which is an electronic chemical required in the manufacture of semiconductors, discrete devices and MEMS. It's to make high quality abrasive particles in semiconductor industry and can be used as chlorine free or ultra-low chlorine insulation materials and heat resistant materials.

**1.3 Details of the supplier of the safety data sheet**

Manufactured/Supplied by Silsource Inc.

ADDRESS: 240 Mary Street, Port Perry, ON L9L 1B7

**CHEMICAL EMERGENCY ONLY (PHONE): CANUTEC [24 Hr.] CANADA 888-226-8832 or 613-996-6666**
**CHEMTREC [24 Hr.] USA 1-800-262-8200**

## SECTION 2: HAZARD IDENTIFICATION

**2.1 GHS Classification**

| | |
|---|---|
| **Physical hazards** | |
| Flammable liquid | Category 3 |
| **Health hazard** | |
| Skin corrosion/irritation | Category 2 |
| Serious eye injury/irritation | Category 2A |
| Acute toxicity – inhalation | Category 4 |
| Specific target organ toxicity - single exposure | Category 3, respiratoru irritation |

**2.2 GHS Label elements**

| | |
|---|---|
| **Pictogram** | |
| **Signal word** | Danger |
| **Hazard statement(s)** | |
| H226 | flammable liquid and vapor |
| H315 | Causes skin irritation |
| H319 | Causes serious eye irritation |
| H332 | Harmful by inhalation |
| H335 | May cause respiratory irritation |
| **Precautionary statement(s)** | |
| P210 | Keep away from heat, sparks, open flames and hot surfaces. No smoking. |
| P240 | Ground/equipotiential connection between container and landing equipment |
| P242 | Use only non-sparking tools. |
| P243 | Take measures to prevent electrostatic discharge. |
| P241 | Use explosion-proof electrical/ventilation/lighting equipment. |
| P260 | Do not breathe dust/fume/gas/mist/vapor/spray. |
| P264 | Wash thoroughly after work. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection |
| **Reaction statement(s)** | |
| P303 + P361 + P353 | IF ON SKIN (OR HAIR): Immediately remove/take off all contaminated clothing. Wash skin/shower with water. |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth, do not induce vomiting. |
| P304 + P340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes.Remove contact lenses if they are worn and easily accessible. Continue rinsing. |
| P370 + P378 | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish |
| **Safe Storage(s)** | |
| P403+P235 | Store in a ventilated, cool and dry place. |

**Waste disposal**

P501 Dispose of contents/containers in accordance with local regulations.

**2.3 Other hazards**

Chronic No data available

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

**3.1 Substances**

| Chemical name | CAS number | Concentration |
|---|---|---|
| TETRAETHYL ORTHOSILICATE | 78-10-4 | ≥99.5% |
| Ethanol | 64-17-5 | ≤0.5% |

## SECTION 4: FIRST AID MEASURES

**4.1 Description of first aid measures**

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

**If inhaled** Move victim to fresh air, keep breathing, and rest. Immediately call a POISON CENTER/doctor if you feel unwell

**If skin contact** Immediately remove/take off all contaminated clothing.
Wash gently with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention

**If in eyes** Rinse carefully with water for a few minutes.If convenient and easy to operate, remove contact lenses.Continue cleaning.If eye irritation: Get medical advice/attention

**If swallowed** If you feel unwell, seek medical advice/attention. Gargle

**Protection of emergency rescuer** Rescuers need to wear personal protective equipment, such as rubber gloves and air-tight goggles

## SECTION 5: FIRE-FIGHTING MEASURES

**5.1 Flash point**

Flash point is about 48℃ (Test method: closed cup)

**5.2 Suitable extinguishing media**

In large fires: dry powder.
In small fires: carbon dioxide, dry powder and sand.
Prohibition: water, foam and acid-base fire extinguishing agents

**5.3 Specific hazards during fire fighting**

Take care as it may decompose to produce poisonous fume upon combustion or in high temperature, and in contact with water, irritant gases would be released after hydrolyzed

**5.4 Special method**

Determine if the area needs to be evacuated or quarantined based on the local emergency plan. Keep containers exposed to fire cool by spraying water

**5.5 Special protective equipment for firemen**

Always wearing personal protective equipment when fighting fires

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment.
Avoid breathing vapors, mists or gases.
Ensure adequate ventilation

**6.2 Environmental preventive measures**

Under safe conditions, take steps to prevent further leakage or spillage.
Do not let product enter drains. Prevent discharge into the surrounding environment

**6.3 Methods and materials for restraining and cleaning up the spills**

Absorb with inert absorbent material and dispose of as hazardous waste.
Store in a suitable closed disposal container

## SECTION 7: HANDLING AND STORAGE

**7.1 Precautions for operation and disposal**

Handle in a well-ventilated place.
Wear suitable protective equipment.
Prevent smoke generation.
Keep away from heat/sparks/open flames/hot surfaces.
No smoking.
Take measures to prevent the accumulation of static electricity.
Use explosion-proof equipment.
Wash hands and face thoroughly after handling

**7.2 Protection against fire and explosion**

Take fire protection measures

**7.3 Precautions for storage**

Store in a cool place;
Keep container tightly closed in a dry and well-ventilated place;
Containers which are opened must be carefully resealed and kept upright to prevent leakage

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Maximum allowable concentration**

| Component | CAS number | Maximum allowable concentration |
|---|---|---|
| TETRAETHYL ORTHOSILICATE | 78-10-4 | ACGIH TLV(TWA): 10 ppm<br>OSHA PEL(TWA): 100 ppm |

**8.2 Exposure controls**

**Exposure in the work place limited and controlled**

xxx

**Personal protection**

| | |
|---|---|
| Respiratory protection: | Gas mask. In accordance with local and government regulations |
| Hand protection: | Protective gloves |
| Eye protection: | Safety goggles. Wear a mask if the situation requires it |
| Skin and body protection: | Protective clothing. Wear protective boots if the situation requires |

**Environmental protection**

| | |
|---|---|
| Local Ventilation: | Recommended |
| Conventional Ventilation: | Recommended |

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**9.1 Information on basic physical and chemical properties**

| | |
|---|---|
| **Physical state/form** | Liquid |
| **Color** | Colorless |
| **PH** | No data available |
| **Boiling point** | 168℃（lit.） |
| **Melting point** | -77℃ |
| **Flash point** | 48℃(closed cup) |
| **Molecular weight** | 208.33 |
| **Auto-ignition temperature** | No data available |
| **Oxidation properties** | No |
| **Upper explosion limit** | 23%（V） |
| **Lower explosion limit** | 1.3%（V） |
| **Vapor pressure** | No data available |
| **Vapour density** | No data available |
| **Proportion** | 0.915～0.945g/cm$^3$ (20℃) |
| **Solubility** | React with water |
| **Heat of combustion** | No data available |
| **Viscosity（20℃）** | No data available |

## SECTION 10: STABILITY AND REACTIVITY

**10.1 General information**

Store and handle in accordance with normal industrial practice without adverse reactions

**10.2 Chemical stability:**

Moisture sensitive

**10.3 Reactivity**

**Conditions to avoid:**

Incompatible materials, sources of ignition, excess heat, exposure to moist air

**Hazardous Decomposition Products:**

Carbon oxides and incompletely combusted carbon compounds, silicon dioxide

**Hazardous polymerization:**

Polymerization may occur upon exposure to water, strong acids, and heat

## SECTION 11: TOXICOLOGICAL INFORMATION

**11.1 Route of Infectione:**

Inhalation, skin contact and accidental ingestion

**11.2 Signs and Symptoms of Overexposure:**

Harmful if inhaled. May be harmful if swallowed. Causes serious eye damage. May cause skin irritation. May cause allergic skin reactions

**11.3 Acute Toxicity:**

| Chemical Name | CAS number | LD50 (Oral) | LD50 (Dermal) | LC50 (Inhalation) |
|---|---|---|---|---|
| TETRAETHYL ORTHOSILICATE | 78-10-4 | 6270mg/kg (Rat) | 5859 mg/kg (Rabbit) | 500 mg/l (Rabbit, 24H) |

**Potential health effects**

**Inhalation** Harmful if inhaled, may cause respiratory irritation

**Ingestion** Harmful if swallowed

**Skin** Harmful if absorbed through skin, repeated skin contact may cause skin irritation

**Eyes** Cause eye irritation

**11.4 Chronic Toxicity**

Toxicity of organic silicon compound is generally low

**11.5 Other health hazard information**

No data available

## SECTION 12: ECOLOGICAL INFORMATION

**12.1 Ecotoxicity**

**Fish:** No data available

**Water louse and other aquatic invertebrates:**

No data available

**Algae:** No data available

**12.2 Residual/degradability:**

This product is hydrolyzed in water or humid air to release ethanol and organosilicon compounds

**12.3 Bioaccumulative potential:**

No data available

**12.4 Mobility in Soil:**

No data available

**12.5 Additional Environmental Information:**

Environmental damage cannot be ruled out even after professional treatment or disposal

## SECTION 13: DISPOSAL CONSIDERATIONS

**13.1 Product disposal:**

Dispose of in accordance with local regulations.

**13.2 Packaging disposal:**

Dispose of in accordance with local regulations.

## SECTION 14: TRANSPORT INFORMATION

**14.1 UN-Number**
UN1292
**14.2 UN Proper Shipping Name**
TETRAETHYL ORTHOSILICATE
**14.3 Transport hazard class(es)**
3 Flammable Liquids
**14.4 Packing group**
III
**14.5 Technical name**
TETRAETHYL ORTHOSILICATE

## SECTION 15: REGULATORY INFORMATION

National and local regulations must be observed. For information on labeling, please refer to section 2 of this document. The Regulations for the Safe Administration of Hazardous Chemicals in the Workplace(issued by Council of the PRC on February 16, 2011): Relevant provisions are made for the safe use, production, storage, transportation, loading and unloading of hazardous chemicals

## SECTION 16: OTHER INFORMATION

This data is offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is made. The recommended handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use.

This SDS was prepared sincerely on the basis of the information we could obtain, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. Products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling, sufficient care should be taken, in addition to the safety measures suitable for the situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.

This SDS is compliant with the GHS requirements outlined at http://www.ccohs.ca/oshanswers/chemicals/whmis_ghs/sds.html

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