

# Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	<b>Combustible material; avoid heat and sources of ignition.</b> <b>Harmful compound, minimize exposure.</b> <b>Irritating to skin, eyes, and the respiratory system.</b> <b>Moisture sensitive material.</b> <b>Store under nitrogen.</b>	

## Section I. Chemical Product and Company Identification

Chemical Name	<b>Tetraethyl Orthosilicate</b>		
Catalog Number	T0100	Supplier	TCI America 9211 N. Harborgate St. Portland OR 1-800-423-8616
Synonym	Tetraethoxysilane		
Chemical Formula	(C <sub>2</sub> H <sub>5</sub> O) <sub>4</sub> Si		
CAS Number	78-10-4	In case of Emergency Call	<b>Chemtrec®</b> <b>(800) 424-9300 (U.S.)</b> <b>(703) 527-3887 (International)</b>

## Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Tetraethyl Orthosilicate	78-10-4	Min. 96.0 (GC)	TWA: 10 STEL: 30 (ppm) from ACGIH TWA: 10 (ppm) from OSHA  Consult local authorities for acceptable exposure limits.	Rat LDLo (oral) 6270 mg/kg Rat LCLo (inhalation) 1000 ppm/4H Rabbit LD <sub>50</sub> (dermal) 63000 mg/kg

## Section III. Hazards Identification

Acute Health Effects	Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	<b>CARCINOGENIC EFFECTS</b> : Not available. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Not available. <b>DEVELOPMENTAL TOXICITY</b> Not available. There is no known effect from chronic exposure to this product. Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.

## Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention. Treat symptomatically and supportively.
Skin Contact	If the chemical gets spilled on a clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical touches the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.
Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt, or waistband. If the victim is not breathing, administer artificial respiration. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

<b>Section V. Fire and Explosion Data</b>			
Flammability	Combustible.	Auto-Ignition	237°C (458.6°F)
Flash Points	46°C (114.8°F).	Flammable Limits	LOWER: 1.3% UPPER: 23%
Combustion Products	These products are toxic carbon oxides (CO, CO <sub>2</sub> ) and metallic oxides.		
Fire Hazards	Flammable in presence of open flames and sparks, of shocks, of heat. Under fire conditions, material may decompose to form flammable and/or explosive mixtures in air.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. <b>High temperatures may cause the containers to explode.</b>		
Fire Fighting Media and Instructions	Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemicals, CO <sub>2</sub> , alcohol foam or water spray. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.		

<b>Section VI. Accidental Release Measures</b>	
Spill Cleanup Instructions	Combustible material. Harmful liquid. Irritating liquid. Under fire conditions, material may decompose to form flammable and/or explosive mixtures in air. Keep away from heat and sources of ignition. Mechanical exhaust required. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.

<b>Section VII. Handling and Storage</b>	
Handling and Storage Information	COMBUSTIBLE. HARMFUL. IRRITANT. MOISTURE SENSITIVE. STORE UNDER NITROGEN. UNDER FIRE CONDITIONS, MATERIAL MAY DECOMPOSE TO FORM FLAMMABLE AND/OR EXPLOSIVE MIXTURES IN AIR. Handle with caution and minimize exposure. Keep away from heat and sources of ignition. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. Do not breathe gas, fumes, vapor or spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Avoid contact with skin and eyes. Always store away from incompatible compounds such as oxidizing agents, acids, moisture.

<b>Section VIII. Exposure Controls/Personal Protection</b>	
Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	TWA: 10 STEL: 30 (ppm) from ACGIH TWA: 10 (ppm) from OSHA  Consult local authorities for acceptable exposure limits.

<b>Section IX. Physical and Chemical Properties</b>			
Physical state @ 20°C	Colorless liquid.	Solubility	Soluble in diethyl ether. Insoluble in cold water, hot water. Miscible with alcohol.
Specific Gravity	0.934	Partition Coefficient	Not available.
Molecular Weight	208.33	Vapor Pressure	<1 mm of Hg (@ 20°C)
Boiling Point	168°C (334.4°F)	Vapor Density	>1 (Air = 1)
Melting Point	-83 to -77°C	Volatility	Not available.
Refractive Index	1.3928	Odor	Ester-like.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	0.6 cP		

**Section X. Stability and Reactivity Data**

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light. Under fire conditions, material may decompose to form flammable and/or explosive mixtures in air.
Incompatibilities	Reactive with oxidizing agents, acids, moisture.

**Section XI. Toxicological Information**

RTECS Number	VV9450000
Routes of Exposure	Eye contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LDLo (oral) 6270 mg/kg Rat LCLo (inhalation) 1000 ppm/4H Rabbit LD <sub>50</sub> (dermal) 63000 mg/kg
Chronic Toxic Effects	<b>CARCINOGENIC EFFECTS</b> : Not available. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Not available. <b>DEVELOPMENTAL TOXICITY</b> Not available. There is no known effect from chronic exposure to this product. Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.
Acute Toxic Effects	Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

**Section XII. Ecological Information**

Ecotoxicity	Not available.
Environmental Fate	Not available.

**Section XIII. Disposal Considerations**

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of this substance.
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**Section XIV. Transport Information**

DOT Classification	DOT CLASS 3: Flammable liquid.
PIN Number	UN1292
Proper Shipping Name	Tetraethyl silicate
Packing Group (PG)	III
DOT Pictograms	

**Section XV. Other Regulatory Information and Pictograms**

TSCA Chemical Inventory (EPA)	This product is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory.
WHMIS Classification (Canada)	WHMIS CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).
EINECS Number (EEC)	201-083-8
EEC Risk Statements	R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R36/38- Irritating to eyes and skin.
Japanese Regulatory Data	Not available.

**Section XVI. Other Information****Version 1.0****Validated on 7/31/1997.****Printed 3/11/2005.****Notice to Reader**

TCl laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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