



# Right to Know Hazardous Substance Fact Sheet

Common Name: **METHYL CHLOROSILANE**

Synonym: Chloromethylsilane

Chemical Name: Silane, Chloromethyl-

Date: December 1999 Revision: January 2009

CAS Number: 993-00-0

RTK Substance Number: 1240

DOT Number: UN 2534

## Description and Use

**Methyl Chlorosilane** is a colorless gas with a distinctive odor. It is used to make water repellant materials.

## Reasons for Citation

- ▶ **Methyl Chlorosilane** is on the Right to Know Hazardous Substance List because it is cited by DOT.
- ▶ This chemical is on the Special Health Hazard Substance List.

[SEE GLOSSARY ON PAGE 5.](#)

## FIRST AID

### Eye Contact

- ▶ Immediately flush with large amounts of water for at least 30 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while flushing. Seek medical attention immediately.

### Skin Contact

- ▶ Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water. Seek medical attention.

### Inhalation

- ▶ Remove the person from exposure.
- ▶ Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
- ▶ Transfer promptly to a medical facility.

## EMERGENCY NUMBERS

Poison Control: 1-800-222-1222

CHEMTREC: 1-800-424-9300

NJDEP Hotline: 1-877-927-6337

National Response Center: 1-800-424-8802

**EMERGENCY RESPONDERS >>>> SEE LAST PAGE**

## Hazard Summary

Hazard Rating	NJDOH	NFPA
<b>HEALTH</b>	3	-
<b>FLAMMABILITY</b>	4	-
<b>REACTIVITY</b>	2- <del>W</del>	-
CORROSIVE FLAMMABLE AND REACTIVE POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

*Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe*

- ▶ **Methyl Chlorosilane** can affect you when inhaled.
- ▶ **Methyl Chlorosilane** is a DOT CORROSIVE material and contact can severely irritate and burn the skin and eyes.
- ▶ Inhaling **Methyl Chlorosilane** can irritate the nose, throat and lungs.
- ▶ **Methyl Chlorosilane** can cause chronic bronchitis with coughing, phlegm and shortness of breath.
- ▶ **Methyl Chlorosilane** is FLAMMABLE and REACTIVE and a DANGEROUS FIRE and EXPLOSION HAZARD.

## Workplace Exposure Limits

No occupational exposure limits have been established for **Methyl Chlorosilane**. However, it may pose a health risk. Always follow safe work practices.

## Determining Your Exposure

- ▶ Read the product manufacturer's Material Safety Data Sheet (MSDS) and the label to determine product ingredients and important safety and health information about the product mixture.
- ▶ For each individual hazardous ingredient, read the New Jersey Department of Health Hazardous Substance Fact Sheet, available on the RTK website ([www.nj.gov/health/eoh/rtkweb](http://www.nj.gov/health/eoh/rtkweb)) or in your facility's RTK Central File or Hazard Communication Standard file.
- ▶ You have a right to this information under the New Jersey Worker and Community Right to Know Act, the Public Employees Occupational Safety and Health (PEOSH) Act if you are a public worker in New Jersey, and under the federal Occupational Safety and Health Act (OSHA) if you are a private worker.
- ▶ The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the PEOSH Hazard Communication Standard (N.J.A.C. 12:100-7) require employers to provide similar information and training to their employees.

This Fact Sheet is a summary of available information regarding the health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

## Health Hazard Information

### Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Methyl Chlorosilane**:

- ▶ Contact can severely irritate and burn the skin and eyes.
- ▶ Inhaling **Methyl Chlorosilane** can irritate the nose, throat and lungs causing coughing, wheezing and/or shortness of breath.

### Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Methyl Chlorosilane** and can last for months or years:

### Cancer Hazard

- ▶ According to the information presently available to the New Jersey Department of Health, **Methyl Chlorosilane** has not been tested for its ability to cause cancer in animals.

### Reproductive Hazard

- ▶ According to the information presently available to the New Jersey Department of Health, **Methyl Chlorosilane** has not been tested for its ability to affect reproduction.

### Other Effects

- ▶ **Methyl Chlorosilane** can irritate the lungs. Repeated exposure may cause bronchitis to develop with coughing, phlegm, and/or shortness of breath.

## Medical

### Medical Testing

If symptoms develop or overexposure is suspected, the following are recommended:

- ▶ Lung function tests

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020).

### Mixed Exposures

- ▶ Smoking can cause heart disease, lung cancer, emphysema, and other respiratory problems. It may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

## Workplace Controls and Practices

Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include: (1) enclosing chemical processes for severely irritating and corrosive chemicals, (2) using local exhaust ventilation for chemicals that may be harmful with a single exposure, and (3) using general ventilation to control exposures to skin and eye irritants. For further information on workplace controls, consult the NIOSH document on Control Banding at [www.cdc.gov/niosh/topics/ctrlbanding/](http://www.cdc.gov/niosh/topics/ctrlbanding/).

The following work practices are also recommended:

- ▶ Label process containers.
- ▶ Provide employees with hazard information and training.
- ▶ Monitor airborne chemical concentrations.
- ▶ Use engineering controls if concentrations exceed recommended exposure levels.
- ▶ Provide eye wash fountains and emergency showers.
- ▶ Wash or shower if skin comes in contact with a hazardous material.
- ▶ Always wash at the end of the workshift.
- ▶ Change into clean clothing if clothing becomes contaminated.
- ▶ Do not take contaminated clothing home.
- ▶ Get special training to wash contaminated clothing.
- ▶ Do not eat, smoke, or drink in areas where chemicals are being handled, processed or stored.
- ▶ Wash hands carefully before eating, smoking, drinking, applying cosmetics or using the toilet.

In addition, the following may be useful or required:

- ▶ Specific actions are required for this chemical by OSHA. Refer to the OSHA *Compressed gases* Standard (29 CFR 1910.101).
- ▶ Before entering a confined space where **Methyl Chlorosilane** may be present, check to make sure that an explosive concentration does not exist.

## Personal Protective Equipment

The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

### Gloves and Clothing

- ▶ Avoid skin contact with **Methyl Chlorosilane**. Wear personal protective equipment made from material which can not be permeated or degraded by this substance. Safety equipment suppliers and manufacturers can provide recommendations on the most protective glove and clothing material for your operation.
- ▶ Safety equipment manufacturers recommend Silver Shield®/4H®, Viton and Barrier® as glove materials for *Organo-Silicon compounds*, and Tychem® BR, LV, Responder®, and TK, or the equivalent, as protective clothing materials for *Organo-Silicon compounds*.

- ▶ All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

### Eye Protection

- ▶ Wear non-vented, impact resistant goggles when working with fumes, gases, or vapors.
- ▶ Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.
- ▶ Do not wear contact lenses when working with this substance.

### Respiratory Protection

**Improper use of respirators is dangerous.** Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

- ▶ At any detectable concentration, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

## Fire Hazards

If employees are expected to fight fires, they must be trained and equipped as stated in the OSHA Fire Brigades Standard (29 CFR 1910.156).

- ▶ **Methyl Chlorosilane** is a FLAMMABLE and REACTIVE GAS.
- ▶ Extinguish fire only if flow can be stopped.
- ▶ Use dry chemical, CO<sub>2</sub>, alcohol-resistant foam or other foam extinguishing agents, as water may not be effective in fighting fires.
- ▶ Water may form flammable and toxic gases.
- ▶ POISONOUS GASES ARE PRODUCED IN FIRE, including *Hydrogen Chloride* and *Phosgene*.
- ▶ CONTAINERS MAY EXPLODE IN FIRE.
- ▶ Vapors may travel to a source of ignition and flash back.

### Spills and Emergencies

If employees are required to clean-up spills, they must be properly trained and equipped. The OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120) may apply.

If **Methyl Chlorosilane** is leaked, take the following steps:

- ▶ Evacuate personnel and secure and control entrance to the area.
- ▶ Eliminate ignition sources.
- ▶ Ventilate area of leak to disperse the gas.
- ▶ Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to empty.
- ▶ Keep **Methyl Chlorosilane** out of confined spaces, such as sewers, because of the possibility of an explosion.
- ▶ DO NOT wash into sewer.
- ▶ It may be necessary to contain and dispose of **Methyl Chlorosilane** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.

### Handling and Storage

Prior to working with **Methyl Chlorosilane** you should be trained on its proper handling and storage.

- ▶ **Methyl Chlorosilane** may react violently with WATER; MOIST AIR; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); and ORGANIC ACIDS (such as ACETIC ACID) to form flammable and toxic *Hydrogen Chloride* and *Hydrogen gases*.
- ▶ **Methyl Chlorosilane** attacks many METALS in the presence of WATER and MOISTURE.
- ▶ Store in tightly closed containers in a cool, well-ventilated area away from HEAT SOURCES and HOT SURFACES as toxic *Hydrogen Chloride* and *Phosgene gases* may be produced.
- ▶ Sources of ignition, such as smoking and open flames, are prohibited where **Methyl Chlorosilane** is used, handled, or stored.
- ▶ Metal containers involving the transfer of **Methyl Chlorosilane** should be grounded and bonded.
- ▶ Use explosion-proof electrical equipment and fittings wherever **Methyl Chlorosilane** is used, handled, manufactured, or stored.
- ▶ Use only non-sparking tools and equipment, especially when opening and closing containers of **Methyl Chlorosilane**.

### Occupational Health Information Resources

The New Jersey Department of Health offers multiple services in occupational health. These services include providing informational resources, educational materials, public presentations, and industrial hygiene and medical investigations and evaluations.

#### For more information, please contact:

New Jersey Department of Health  
 Right to Know  
 PO Box 368  
 Trenton, NJ 08625-0368  
 Phone: 609-984-2202  
 Fax: 609-984-7407  
 E-mail: [rtk@doh.state.nj.us](mailto:rtk@doh.state.nj.us)  
 Web address: <http://www.nj.gov/health/eoh/rtkweb>

***The Right to Know Hazardous Substance Fact Sheets are not intended to be copied and sold for commercial purposes.***

## GLOSSARY

**ACGIH** is the American Conference of Governmental Industrial Hygienists. They publish guidelines called Threshold Limit Values (TLVs) for exposure to workplace chemicals.

**Acute Exposure Guideline Levels (AEGLs)** are established by the EPA. They describe the risk to humans resulting from once-in-a-lifetime, or rare, exposure to airborne chemicals.

**Boiling point** is the temperature at which a substance can change its physical state from a liquid to a gas.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is unique, identifying number, assigned by the Chemical Abstracts Service, to a specific chemical.

**CFR** is the Code of Federal Regulations, which are the regulations of the United States government.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes destruction of human skin or severe corrosion of containers.

**DEP** is the New Jersey Department of Environmental Protection.

**DOT** is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

**EPA** is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

**ERG** is the Emergency Response Guidebook. It is a guide for emergency responders for transportation emergencies involving hazardous substances.

**Emergency Response Planning Guideline (ERPG)** values provide estimates of concentration ranges where one reasonably might anticipate observing adverse effects.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

**IARC** is the International Agency for Research on Cancer, a scientific group.

**Ionization Potential** is the amount of energy needed to remove an electron from an atom or molecule. It is measured in electron volts.

**IRIS** is the Integrated Risk Information System database on human health effects that may result from exposure to various chemicals, maintained by federal EPA.

**LEL or Lower Explosive Limit**, is the lowest concentration of a combustible substance (gas or vapor) in the air capable of continuing an explosion.

**mg/m<sup>3</sup>** means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

**NFPA** is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

**NIOSH** is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

**NTP** is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

**OSHA** is the federal Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

**PEOSHA** is the New Jersey Public Employees Occupational Safety and Health Act, which adopts and enforces health and safety standards in public workplaces.

**Permeated** is the movement of chemicals through protective materials.

**ppm** means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

**Protective Action Criteria (PAC)** are values established by the Department of Energy and are based on AEGLs and ERPGs. They are used for emergency planning of chemical release events.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

**STEL** is a Short Term Exposure Limit which is usually a 15-minute exposure that should not be exceeded at any time during a work day.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

**UEL or Upper Explosive Limit** is the highest concentration in air above which there is too much fuel (gas or vapor) to begin a reaction or explosion.

**Vapor Density** is the ratio of the weight of a given volume of one gas to the weight of another (usually *Hydrogen*), at the same temperature and pressure.

The **vapor pressure** is a force exerted by the vapor in equilibrium with the solid or liquid phase of the same substance. The higher the vapor pressure the higher concentration of the substance in air.

Common Name: **METHYL CHLOROSILANE**

Synonym: Chloromethylsilane

CAS No: 993-00-0

 Molecular Formula: CH<sub>3</sub>ClSi

RTK Substance No: 1240

Description: Colorless gas with a distinctive odor

**HAZARD DATA**

Hazard Rating	Firefighting	Reactivity
<b>3 - Health</b> <b>4 - Fire</b> <b>2-W - Reactivity</b> DOT#: UN 2534 ERG Guide #: 119 Hazard Class: 2.3 (Toxic gas)	<b>FLAMMABLE AND REACTIVE GAS</b> Extinguish fire only if flow can be stopped. Use dry chemical, CO <sub>2</sub> , alcohol-resistant foam or other foam extinguishing agents, as water may not be effective in fighting fires. Water may form flammable and toxic gases. <b>POISONOUS GASES ARE PRODUCED IN FIRE, including Hydrogen Chloride and Phosgene.</b> <b>CONTAINERS MAY EXPLODE IN FIRE.</b> Vapors may travel to a source of ignition and flash back.	<b>Methyl Chlorosilane</b> may react violently with WATER; MOIST AIR; OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); STRONG ACIDS (such as HYDROCHLORIC, SULFURIC and NITRIC); and ORGANIC ACIDS (such as ACETIC ACID) to form flammable and toxic <i>Hydrogen Chloride</i> and <i>Hydrogen gases</i> . <b>Methyl Chlorosilane</b> attacks many METALS in the presence of WATER and MOISTURE.

**SPILL/LEAKS**
**Isolation Distance:**

Small Spill: 30 meters (100 feet)

Large Spill: 300 meters (1,000 feet)

Fire: 1,600 meters (1 mile)

Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to empty.

 Use only non-sparking tools and equipment, especially when opening and closing containers of **Methyl Chlorosilane**.

 Keep **Methyl Chlorosilane** out of confined spaces, such as sewers, because of the possibility of an explosion.

DO NOT wash into sewer.

**PHYSICAL PROPERTIES**
**Odor Threshold:** Distinctive odor

**Flash Point:** 16° to 55°F (-9° to 13°C)

**Vapor Pressure:** 137 mm Hg at 68°F (20°C)

**Water Solubility:** Insoluble/Reactive

**Molecular Weight:** 80.6

**EXPOSURE LIMITS**

The Protective Action Criteria values are:

PAC-1 = 1.8 ppm

PAC-2 = 22 ppm

PAC-3 = 100 ppm

**PROTECTIVE EQUIPMENT**
**Gloves:** Silver Shield®/4H®, Viton and Barrier® (>4-hr breakthrough for *Organo-Silicon compounds*)

**Coveralls:** Tychem® BR, LV, Responder®, and TK (>8-hr breakthrough for *Organo-Silicon compounds*)

**Respirator:** >1.8 ppm - SCBA

**HEALTH EFFECTS**
**Eyes:** Irritation and burns

**Skin:** Irritation and burns

**Inhalation:** Nose, throat and lung irritation, with coughing, wheezing and shortness of breath

**FIRST AID AND DECONTAMINATION**
**Remove** the person from exposure.

**Flush** eyes with large amounts of water for at least 30 minutes. Remove contact lenses if worn. Seek medical attention immediately

**Quickly** remove contaminated clothing and wash contaminated skin with large amounts of soap and water. Seek medical attention.

**Begin** artificial respiration if breathing has stopped and CPR if necessary.

**Transfer** promptly to a medical facility.