

## MATERIAL SAFETY DATA SHEET

Date Printed: 04/09/2009

Date Updated: 03/05/2009

Version 1.8

## Section 1 - Product and Company Information

Product Name TETRACHLOROETHENE EXTRA PURE  
(TETRA-CHLOROETHYLENE)  
Product Number 16211  
Brand SIAL  
Company Sigma-Aldrich  
Address 3050 Spruce Street  
SAINT LOUIS MO 63103 US  
Technical Phone: 800-325-5832  
Fax: 800-325-5052  
Emergency Phone: 314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
TETRACHLOROETHYLENE	127-18-4	Yes

Formula C2Cl4

Synonyms

Ankilostin \* Antisol 1 \* Carbon bichloride \*  
Carbon dichloride \* Czterochloroetylen (Polish) \*  
Didakene \* Dilatin PT \* Dow-per \* ENT 1,860 \*  
Ethene, tetrachloro- \* Ethylene tetrachloride \*  
Fedal-UN \* NCI-C04580 \* PER \* Perawin \*  
Perchloroethylen, per (Dutch) \* Perchlor \*  
Perchloraethylen, per (German) \* Perchloroethylene  
\* Perchloroethylene (ACGIH:OSHA) \* Perclene \*  
Perclene D \* Perchloroethylene (Italian) \*  
Percosolve \* PERK \* Perklone \* Persec \* RCRA  
waste number U210 \* Tetlen \* Tetracap \*  
Tetrachlooretheen (Dutch) \* Tetrachloraethen  
(German) \* Tetrachloethylene \* Tetrachloroethene  
\* Tetrachloroethylene (IUPAC) \*  
1,1,2,2-Tetrachloroethylene \* Tetrachloroethylene  
(DOT:OSHA) \* Tetracloroetene (Italian) \*  
Tetraleno \* Tetralex \* Tetravec \* Tetroguer \*  
Tetropil

RTECS Number: KX3850000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Toxic. Dangerous for the environment.

Irritating to eyes, respiratory system and skin. Toxic to aquatic organisms. May cause cancer.

Target organ(s): Liver. Kidneys. Calif. Prop. 65 carcinogen.

## HMIS RATING

HEALTH: 0\*

FLAMMABILITY: 0

REACTIVITY: 0

NFPA RATING  
HEALTH: 0  
FLAMMABILITY: 0  
REACTIVITY: 0

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

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#### Section 4 - First Aid Measures

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##### ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

##### INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

##### DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

##### EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

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#### Section 5 - Fire Fighting Measures

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##### FLASH POINT

N/A

##### AUTOIGNITION TEMP

N/A

##### FLAMMABILITY

N/A

##### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

##### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.  
Specific Hazard(s): Emits toxic fumes under fire conditions.

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#### Section 6 - Accidental Release Measures

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##### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

##### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

##### METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

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## Section 7 - Handling and Storage

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### HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

### STORAGE

Suitable: Keep tightly closed.

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## Section 8 - Exposure Controls / PPE

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### ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

### PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

### GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

### EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	100 PPM
USA	ACGIH	TWA	25 PPM
USA	MSHA Standard-air	TWA	100 PPM (670 MG/M3)
USA	OSHA.	PEL	8H TWA 100 PPM;CL 200;PK 300/5
USA	NIOSH		LOWEST FEASIBLE CONC.

### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	60 MG/M3
Poland		NDSch	480 MG/M3
Poland		NDSP	-

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## Section 9 - Physical/Chemical Properties

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Appearance                      Physical State: Clear liquid  
Color: Colorless

Property	Value	At Temperature or Pressure
Molecular Weight	165.83 AMU	
pH	N/A	
BP/BP Range	120.0 - 122.0 °C	
MP/MP Range	- 22.0 °C	
Freezing Point	N/A	
Vapor Pressure	13 mmHg	20 °C
Vapor Density	5.83 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.622 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	

Volatile%	N/A
VOC Content	N/A
Water Content	N/A
Solvent Content	N/A
Evaporation Rate	N/A
Viscosity	N/A
Surface Tension	N/A
Partition Coefficient	N/A Log Kow: 3.4
Decomposition Temp.	N/A
Flash Point	N/A
Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	N/A
Refractive Index	1.506
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	N/A

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Strong bases.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation.

Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Nerves. Heart. Liver. Kidneys.

### SIGNS AND SYMPTOMS OF EXPOSURE

Damage to the kidneys. Damage to the liver. Narcotic effect.

Exposure can cause:

### TOXICITY DATA

Oral

Rat

2629 mg/kg

LD50

Inhalation

Rat

34,200 mg/m<sup>3</sup>

LC50

Intraperitoneal

Rat

4678 MG/KG

LD50

Oral

Mouse

8100 mg/kg

LD50

Remarks: Behavioral:General anesthetic.

Inhalation

Mouse

5,200 ppm

LC50

Subcutaneous

Mouse

65 GM/KG

LD50

Remarks: Behavioral:Ataxia. Behavioral:Sleep.

Intraperitoneal

Dog

2100 MG/KG

LD50

Remarks: Liver:Liver function tests impaired.

#### IRRITATION DATA

Skin

Rabbit

810 mg

24H

Remarks: Severe irritation effect

Skin

Rabbit

500 mg

24H

Remarks: Mild irritation effect

Eyes

Rabbit

162 mg

Remarks: Mild irritation effect

Eyes

Rabbit

500 mg

24H

Remarks: Mild irritation effect

#### CHRONIC EXPOSURE - CARCINOGEN

Result: This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Species: Rat

Route of Application: Inhalation

Dose: 200 PPM

Exposure Time: 6H/2Y

Frequency: I  
Result: Blood:Leukemia Tumorigenic:Carcinogenic by RTECS  
criteria. Tumorigenic Effects: Testicular tumors.

Species: Mouse  
Route of Application: Oral  
Dose: 195 GM/KG  
Exposure Time: 50W  
Frequency: I  
Result: Liver:Tumors. Tumorigenic:Carcinogenic by RTECS criteria.

Species: Mouse  
Route of Application: Inhalation  
Dose: 100 PPM  
Exposure Time: 6H/2Y  
Frequency: I  
Result: Liver:Tumors. Tumorigenic:Carcinogenic by RTECS criteria.

Species: Mouse  
Route of Application: Oral  
Dose: 240 GM/KG  
Exposure Time: 62W  
Frequency: I  
Result: Liver:Tumors. Tumorigenic:Carcinogenic by RTECS criteria.

Species: Rat  
Route of Application: Inhalation  
Dose: 200 PPM  
Exposure Time: 6H/2Y  
Frequency: I  
Result: Tumorigenic:Neoplastic by RTECS criteria. Kidney,  
Ureter, Bladder:Kidney tumors. Blood:Leukemia

Species: Mouse  
Route of Application: Inhalation  
Dose: 100 PPM  
Exposure Time: 6H/2Y  
Frequency: I  
Result: Tumorigenic:Neoplastic by RTECS criteria. Liver:Tumors.

#### IARC CARCINOGEN LIST

Rating: Group 2A

#### NTP CARCINOGEN LIST

Rating: Clear evidence.  
Species: Mouse  
Route: Gavage

#### CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 1000 PPM/24H  
Route of Application: Inhalation  
Exposure Time: (14D PRE/1-22D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal  
system.

Species: Rat  
Dose: 1000 PPM/24H  
Route of Application: Inhalation

Exposure Time: (1-22D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse  
Dose: 300 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (6-15D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Homeostasis

#### CHRONIC EXPOSURE - MUTAGEN

Species: Human  
Dose: 100 MG/L  
Cell Type: lung  
Mutation test: Unscheduled DNA synthesis

Species: Rat  
Dose: 97 UMOL/L  
Cell Type: Embryo  
Mutation test: Morphological transformation.

Species: Rat  
Route: Inhalation  
Dose: 500 PPM  
Mutation test: Cytogenetic analysis

Species: Mouse  
Route: Intraperitoneal  
Dose: 4 MMOL/KG  
Mutation test: DNA damage

Species: Mouse  
Route: Oral  
Dose: 1 GM/KG  
Mutation test: Other mutation test systems

Species: Mouse  
Dose: 100 PPM  
Cell Type: S. typhimurium  
Mutation test: Host-mediated assay

Species: Mouse  
Route: Inhalation  
Dose: 500 PPM  
Mutation test: sperm

Species: Hamster  
Dose: 190 UMOL/L  
Cell Type: lung  
Mutation test: SLN

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 900 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (7-13D PREG)  
Result: Effects on Newborn: Behavioral. Effects on Newborn:

Biochemical and metabolic. Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Species: Rat

Dose: 300 PPM/7H

Route of Application: Inhalation

Exposure Time: (6-15D PREG)

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat

Dose: 1000 PPM/6H

Route of Application: Inhalation

Exposure Time: (MULTIGENERATION)

Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Mouse

Dose: 500 PPM/7H

Route of Application: Inhalation

Exposure Time: (5D MALE)

Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

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## Section 12 - Ecological Information

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No data available.

### ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish

Species: *Cyprinodon variegatus* (Sheepshead minnow)

Time: 96 h

Value: 9.8 mg/l

Test Type: EC50 Daphnia

Species: *Daphnia magna*

Time: 48 h

Value: 7.5 mg/l

Test Type: LC50 Fish

Species: *Lepomis macrochirus* (Bluegill)

Time: 96 h

Value: 13 mg/l

Test Type: LC50 Fish

Species: *Onchorhynchus mykiss* (Rainbow trout)

Time: 96 h

Value: 4.9 mg/l

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations. (DN) Requires special label: "Contains a substance which is regulated by Danish work environmental law due to the risk of carcinogenic properties."

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## Section 14 - Transport Information

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DOT

Proper Shipping Name: Tetrachloroethylene  
UN#: 1897  
Class: 6.1  
Packing Group: Packing Group III  
Hazard Label: Toxic Substance  
PIH: Not PIH

IATA

Proper Shipping Name: Tetrachloroethylene  
IATA UN Number: 1897  
Hazard Class: 6.1  
Packing Group: III

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Section 15 - Regulatory Information

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EU DIRECTIVES CLASSIFICATION

Symbol of Danger: Xn-N  
Indication of Danger: Harmful. Dangerous for the environment.  
R: 40-51/53  
Risk Statements: Limited evidence of a carcinogenic effect.  
Toxic to aquatic organisms, may cause long-term adverse effects  
in the aquatic environment.  
S: 23-36/37-61  
Safety Statements: Do not breathe vapor. Wear suitable  
protective clothing and gloves. Avoid release to the  
environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic. Dangerous for the environment.  
Risk Statements: Irritating to eyes, respiratory system and  
skin. Toxic to aquatic organisms. May cause cancer.  
Safety Statements: In case of accident or if you feel unwell,  
seek medical advice immediately (show the label where possible).  
In case of contact with eyes, rinse immediately with plenty of  
water and seek medical advice. Wear suitable protective  
clothing, gloves, and eye/face protection.  
US Statements: Target organ(s): Liver. Kidneys. Calif. Prop. 65  
carcinogen.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes  
DEMINIMIS: 0.1 %  
NOTES: This product is subject to SARA section 313 reporting  
requirements.  
TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s)  
known to the state of California to cause cancer. This product  
is or contains chemical(s) known to the state of California to  
cause cancer.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in  
accordance with the hazard criteria of the CPR, and the MSDS  
contains all the information required by the CPR.  
DSL: Yes  
NDSL: No

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

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