An ISO 9001:2000 Certified Company

THE POWER OF THREE[3]
PHARMCO-AAPER
AND COMMERCIAL ALCOHOLS

Product Information (203) 740-3471 / Emergency Assistance CHEMTREC 1-800-424-9300

MATERIAL SAFETY DATA SHEETS

Manufacturer: PHARMCO-AAPER
58 Vale Road
Brookfield, Connecticut 06804, USA
Phone (203) 740-3471
Fax (203) 740-3481

1101 Isaac Shelby Drive
Shelbyville, KY 40065
Phone (502) 633-0650
Fax (502) 633-0685

Emergency Contact:
CHEMTREC 1-800-424-9300

Section 1 - Product and Company Information

Product Name PERCHLOROETHYLENE TETRACHLOROETHYLENE

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 * Perchloorethyleen, per (Dutch) * Perchlor * Perchloraethylen, per (German) * Perchlorethylene * Perchloroethylene (ACGIH:OSHA) * Perclene * Perclene D * Percloroetilene (Italian) * Percosolve * PERK * Perklone * Persec * RCRA waste number U210 * Tetlen * Tetracap * Tetrachlooretheen (Dutch) * Tetrachloraethen (German) * Tetrachlorethylene * Tetrachloroethene * Tetrachloroethylene (IUPAC) * 1,1,2,2-Tetrachloroethylene * Tetrachloroethylene (DOT:OSHA) * Tetracloroetene (Italian) * Tetraleno * Tetralex * Tetravec * Tetroguer * Tetropil

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: 10
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.

Section 4 - First Aid Measures
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.

Section 5 - Fire Fighting Measures
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.

Section 6 - Accidental Release Measures
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.

Section 7 - Handling and Storage

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.

Section 8 - Exposure Controls / PPE

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		-

Section 9 - Physical/Chemical Properties

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
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

Section 10 - Stability and Reactivity
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
Section 11 - Toxicological Information
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/m3 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).

Section 12 - Ecological Information
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

Section 13 - Disposal Considerations
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 Dannish work environmental law due to the risk of carcinogenic properties."

Section 14 - Transport Information

DOT
Proper Shipping Name: Tetrachloroethylene
UN#: 1897
Class: 6.1
Packing Group: III
Hazard Label: Toxic Substance
PIH: NO
IATA
Proper Shipping Name: Tetrachloroethylene
IATA UN Number: 1897
Hazard Class: 6.1
Packing Group: 3

Section 15 - Regulatory Information

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

Section 16 - Other Information

DISCLAIMER

The information contained herein is based on data considered to be accurate based on the material as packaged. However, no warranty is expressed regarding the accuracy of these data or the results to be obtained from the use thereof. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It is the user's obligation to determine the conditions of safe use of the product. While this MSDS is based on technical data judged to be reliable, PHARMCO-AAPER assumes not responsibility for the completeness or accuracy of the information contained herein.