The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

Vertrel(R) SDG
6501FR Revised 12-DEC-2007

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont Fluoroproducts
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS
Product Information : 1-800-441-7515 (outside the U.S. 302-774-1000)
Transport Emergency : CHEMTREC 1-800-424-9300(outside U.S. 703-527-3887)
Medical Emergency : 1-800-441-3637 (outside the U.S. 302-774-1000)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
Trans, 1,2-Dichloroethylene	156-60-5	65-90
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-	138495-42-8	5-25
Proprietary Hydrofluorocarbon		5-15

HAZARDS IDENTIFICATION

Potential Health Effects

Inhalation may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness; or tremors, nausea, vomiting, weakness, and abdominal cramps. Other effects may include irregular heart beat with a strange sensation in the chest, "heart thumping",apprehension, lightheadedness, feeling of fainting, dizziness, or weakness.

Skin contact may cause severe irritation with burning, redness, swelling, pain or rash.

Eye contact may cause severe eye irritation with tearing, pain or blurred vision.

Ingestion may cause pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish

(HAZARDS IDENTIFICATION - Continued)

discoloration of the skin: symptoms may be delayed. Ingestion may also cause pathological changes in the liver, central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness, and structural (pathological) changes in heart muscle tissue.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

Flush skin with water after contact. Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians

Activated charcoal mixture may be beneficial. Suspend 50 g activated charcoal in 400 mL water and mix well. Administer 5 mL/kg, or 350 mL for an average adult.

FIRE FIGHTING MEASURES

Flammable Properties

Flammable limits in Air, % by Volume

LEL: 7.0 %
UEL: 14.0 %

Flash Point : None
Method : Pensky-Martens Closed Cup (ASTM D 93)

Flash Point : None
Method : Tag Open Cup (ASTM D 1310)

AUTOIGNITION TEMPERATURE:

Has not yet been determined for "Vertrel" SDG.

Fire and Explosion Hazards:

Use water spray or fog to cool containers. Drums may rupture under fire conditions. Decomposition may occur.

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

Self-contained breathing apparatus (SCBA) is required if drums rupture and contents are spilled under fire conditions.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Wear self-contained breathing apparatus (SCBA) and full protective gear. Remove source of heat, sparks, and flame.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

(ACCIDENTAL RELEASE MEASURES - Continued)

Spill Clean Up

Immediately evacuate the area and provide maximum ventilation, especially in low places where heavy vapors might collect. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Soak up with sawdust, sand, oil dry or other absorbent material. After all visible traces, including ignitable vapors, have been removed, thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc. as necessary and place in closed containers for disposal.

In spill or leak situations, the composition of vapors above the liquid may fall within the LEL/UEL and, therefore, become flammable. Provide ventilation and assure no ignition sources are present.

HANDLING AND STORAGE

Handling (Personnel)

Do not inhale. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling. Wash clothing after use.

Handling (Physical Aspects)

Keep container tightly closed.

Storage

Store in a clean, dry area. Do not allow stored product to exceed 52C (125F) to prevent leakage or potential rupture of container from pressure and expansion. Protect from freezing temperatures. If solvent is stored below -10C (14F), mix prior to use.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use only with adequate ventilation.

Vapors are heavier than air, posing a hazard of asphyxia if they are trapped in enclosed or low places.

Personal Protective Equipment

EYE/FACE PROTECTION

(EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

Wear safety glasses. Where splash potential exists, wear chemical splash goggles.

RESPIRATORS

Wear NIOSH approved respiratory protection, as appropriate.

PROTECTIVE CLOTHING

Where there is potential for skin contact have available and wear as appropriate impervious gloves, apron, pants and jacket.

Exposure Guidelines

Applicable Exposure Limits

Trans, 1,2-Dichloroethylene

PEL	(OSHA)	: 200 ppm, 790 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	: 200 ppm, 8 Hr. TWA
AEL *	(DuPont)	: 200 ppm, 8 & 12 Hr. TWA

Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: None Established
AEL *	(DuPont)	: 200 ppm, 8 & 12 Hr. TWA 400 ppm, Ceiling

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

Exposure Guideline Comments

Vertrel(R) SDG has a calculated AEL of 193 ppm. This is calculated in accordance with the ACGIH formula for mixtures.

Proprietary Hydrofluorocarbon:

Based on the manufacturer's safety information, an occupational exposure limit (OEL) of 100 ppm 8-hr is recommended.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Solubility in Water	: Slightly soluble
Odor	: (slight), Pleasant.
Form	: Liquid.
Color	: Clear, Colorless.

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal conditions.

Incompatibility with Other Materials

Incompatible with steam, oxidizers, elevated temperatures, caustic soda, caustic potash, alkali or alkaline earth metals. Contact with highly basic materials, pH 10 and above, is not recommended.

Decomposition

Decomposition products: hydrogen chloride gas, oxides of carbon, hydrofluoric acid and carbonyl fluoride.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

1,1,1,2,3,4,4,5,5,5 decafluoropentane:

Oral LD50: > 5,000 mg/kg in rats
Dermal ALD: > 5,000 mg/kg in rabbits
Inhalation, 4 hour LC50: 11,100 ppm in rats

Proprietary Hydrofluorocarbon:

Oral LD50: >2 g/kg in rats
Inhalation 4 hour LC50: >10,000 ppm in rats

t-DCE:

Oral LD50: 1275 mg/kg in rats
Dermal LD50: > 5000 mg/kg in rabbits
Inhalation LC50, 4 hr: 24,100 ppm in rats

1,1,1,2,3,4,4,5,5,5 decafluoropentane:

Animal testing indicates that 1,1,1,2,3,4,4,5,5,5 decafluoropentane is a slight skin irritant and a mild eye irritant, but is not a skin sensitizer.

1,1,1,2,3,4,4,5,5,5 decafluoropentane did not cause cardiac sensitization in dogs exposed to 1000 or 5000 ppm. The cardiac sensitization potential was not evaluated at or above 10,000 ppm due to clinical signs consistent with central nervous system toxicity.

(TOXICOLOGICAL INFORMATION - Continued)

Single exposure to 5,000 ppm 1,1,1,2,3,4,4,5,5,5 decafluoropentane by inhalation caused tremors. A different single exposure study by inhalation in rats caused incoordination, hyperactivity and prostration; pathological examination of rats from this study revealed kidney and lung changes, and external hair loss. Repeated exposures to 1,900 - 3,500 ppm caused tremors or convulsions, behavioral effects, and altered clinical chemistry.

In developmental toxicity studies with laboratory animals, 1,1,1,2,3,4,4,5,5,5 decafluoropentane was not uniquely toxic to the developing fetus. No animal data are available to define the carcinogenic or reproductive hazards of 1,1,1,2,3,4,4,5,5,5 decafluoropentane. Tests have shown that 1,1,1,2,3,4,4,5,5,5 decafluoropentane does not cause genetic damage in bacterial or mammalian cell cultures. It has not produced genetic damage in tests on animals.

t-DCE:

t-DCE is a severe eye irritant, and a moderate to severe skin irritant.

Single and repeated exposure to t-DCE by ingestion caused increased kidney weight, histopathological changes of the lungs, liver effects, decreased motor activity, pulmonary edema, cardiovascular system changes, and mortality.

Single and repeated exposure to t-DCE by inhalation caused pathological changes of the liver and lungs, inactivity or anaesthesia, altered white blood cell count, cardiovascular system changes and weak cardiac sensitization, a potentially fatal disturbance of the heart rhythm caused by a heightened sensitivity to the action of epinephrine. Long-term exposure caused altered liver and lung function.

A more recent inhalation study (Dec. 1998) conducted with well-characterized t-DCE containing > 99.4% t-DCE, produced no adverse, compound-related effects. The NOEL was 4000 ppm.

Exposure of pregnant rats shows maternal toxicity at 2000, 6000 and 12,000 ppm. Developmental toxicity was seen only at 12,000 ppm. Tests have shown that t-DCE does not cause genetic damage in bacterial or mammalian cell cultures.

No animal data are available to define the carcinogenic or reproductive hazards of t-DCE.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity:

1,1,1,2,3,4,4,5,5,5 decafluoropentane:

96 hour LC50 - Fathead minnows: 27.2 mg/L
96 hour LC50 - Rainbow trout: 13.9 mg/L
48 hour LC50 - Daphnia magna: 11.7 mg/L

Proprietary Hydrofluorocarbon:

96 hour LC50 - Rainbow trout: 74.2 mg/L

t-DCE:

96 hour LC50 - Bluegill sunfish: 1350 mg/L
48 hour LC50 - Daphnia magna: 220 mg/L

DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

The presence of certain soils in high concentrations may affect the flammability characteristics of the material. Users should test for flammability and test the spent solvent to ensure proper classification for waste disposal.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO/IATA - Not regulated in containers less than 1200 lbs (544 kg).

For containers with net weight greater than 1200 lbs (544 kg), use:

Proper Shipping Name : Environmentally Hazardous Substance, Liquid, N.O.S. (Trans-1,2-Dichloroethylene)
Hazard Class: 9
UN Number: 3082
Packing Group: III
Reportable Quantity: 1000 lbs (Trans-1,2-Dichloroethylene)
1200 lbs (Vertrel(R) SDG)

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Listed.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : No
Fire : No
Reactivity : No
Pressure : No

1,1,1,2,2,3,4,5,5,5-DECAFLUOROPENTANE (CAS# 138495-42-8) is controlled by TSCA Section 5, Significant New Use Rule (SNUR; 40 CFR 721.5645) The approved uses are: precision and general cleaning, carrier fluid, displacement drying, printed circuit board cleaning, particulate removal and film cleaning, process medium, heat transfer fluid (dielectric and non-dielectric), and test fluid. Processors and users of this substance must also comply with the applicable general SNUR requirements set forth in 40 CFR 721 subpart A, including export notification requirements if applicable (40 CFR 721.20), and the applicable record keeping requirements set forth at 40 CFR 721.125.

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating
Health : 2
Flammability : 1
Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : MSDS Coordinator
> : DuPont Fluoroproducts
Address : Wilmington, DE 19898
Telephone : (800) 441-7515

# Indicates updated section.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS