

**DuPont™ VERTREL® XH specialty fluid**

Version 2.0

Revision Date 02/23/2012

Ref. 130000000666

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

**SECTION 1. PRODUCT AND COMPANY IDENTIFICATION**

Product name	:	DuPont™ VERTREL® XH specialty fluid
MSDS Number	:	130000000666
Product Use	:	Cleaning agent
Manufacturer	:	DuPont 1007 Market Street Wilmington, DE 19898
Product Information	:	1-800-441-7515 (outside the U.S. 1-302-774-1000)
Medical Emergency	:	1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency	:	CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

**SECTION 2. HAZARDS IDENTIFICATION**

## Emergency Overview

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Prolonged skin contact may defat the skin and produce dermatitis.  
Dangerous for the ozone layer.

## Potential Health Effects

## Skin

Heptane : Drying of skin with itching, redness or rash

## Eyes

Heptane : May irritate eyes. tearing, Discomfort, Blurred vision.

## Inhalation

1,1,1,2,2,3,4,5,5,5-Decafluoropentane : Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Effects of breathing high concentrations of vapour may include:, Tiredness or drowsiness, Central nervous system effects, Convulsions.



**DuPont™ VERTREL® XH specialty fluid**

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Heptane : Respiratory irritation Central nervous system depression, Anaesthetic effects, dizziness, confusion, incoordination, drowsiness, or unconsciousness, May cause allergic respiratory reaction.. Prolonged contact may cause: irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness, Heart thumping or palpitations, Anaesthetic effects, Fluid in the lungs (pulmonary oedema) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin (symptoms might be delayed).

Ingestion  
Heptane : Aspiration hazard if swallowed - can enter lungs and cause damage. Fluid in the lungs (pulmonary oedema) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin (symptoms might be delayed)

Repeated exposure  
1,1,1,2,2,3,4,5,5,5-  
Decafluoropentane : Adverse effects from repeated inhalation may include: Central nervous system effects

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

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS-No.	Concentration
1,1,1,2,2,3,4,5,5,5-Decafluoropentane	138495-42-8	90 - 96 %
Heptane	142-82-5	4 - 10 %

**SECTION 4. FIRST AID MEASURES**

**DuPont™ VERTREL® XH specialty fluid**

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Skin contact	: Take off all contaminated clothing immediately. Wash off with warm water.
Eye contact	: In case of eye contact Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Inhalation	: Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.
Ingestion	: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Drink 1 or 2 glasses of water. If vomiting occurs, have victim lean forward to reduce the risk of aspiration. Consult a physician.
General advice	: Never give anything by mouth to an unconscious person. Victim to lie down in the recovery position, cover and keep him warm. Give oxygen or artificial respiration if needed. When symptoms persist or in all cases of doubt seek medical advice.
Notes to physician	: Do not give adrenaline or similar drugs.

**SECTION 5. FIREFIGHTING MEASURES**

Flammable Properties	
Flash point	: does not flash
Fire and Explosion Hazard	: Pressure build-up. Fire or intense heat may cause violent rupture of packages. Hazardous combustion products: Hydrogen fluoride Fluorinated hydrocarbons Carbonyl fluoride Carbon oxides The product is not flammable.
Suitable extinguishing media	: Water spray, Water mist, Dry chemical, Carbon dioxide (CO2)

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**Firefighting Instructions** : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire. Exposure to decomposition products may be a hazard to health. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Evacuate personnel to safe areas. Cool containers / tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

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

**Safeguards (Personnel)** : Evacuate personnel to safe areas. Ventilate area, especially low or enclosed places where heavy vapours might collect. In case of insufficient ventilation, wear suitable respiratory equipment. Refer to protective measures listed in sections 7 and 8.

**Spill Cleanup** : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

**Accidental Release Measures** : Prevent further leakage or spillage. Prevent spreading over a wide area (e.g. by containment or oil barriers). Should not be released into the environment.

**SECTION 7. HANDLING AND STORAGE**

**Handling (Personnel)** : Avoid contact with skin, eyes and clothing. Avoid breathing vapours or mist. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8.  
Handle in accordance with good industrial hygiene and safety practice. When using do not eat, drink or smoke. Do not breathe vapours or spray mist. Avoid contact with skin, eyes and clothing. Wash hands before breaks and at the end of workday.

**Handling (Physical Aspects)** : Material should not be dispensed from its container by pouring, except for small sample containers where fume hoods or where other ventilation is used to manage the exposure limits. The use of a drum pump is recommended for



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Version 2.0

Revision Date 02/23/2012

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dispensing from shipping containers.

Storage : Protect from contamination. Keep container tightly closed in a dry and well-ventilated place. Store in original container. Avoid freezing temperatures. If stored below -10 °C (14 °F), mix prior to use.

Storage temperature : < 52 °C (< 126 °F)

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Engineering controls : Use sufficient ventilation to keep employee exposure below recommended limits.

Personal protective equipment  
Respiratory protection : For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Hand protection : Material: Solvent-resistant gloves

Eye protection : Safety glasses with side-shields Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

Skin and body protection : Protective suit

Exposure Guidelines

Exposure Limit Values

1,1,1,2,2,3,4,5,5,5-Decafluoropentane				
AEL *	(DUPONT)	200 ppm	8 & 12 hr. TWA	
AEL *	(DUPONT)	400 ppm	Ceiling Limit Value:	

Heptane				
PEL:	(OSHA)	500 ppm	2,000 mg/m3	8 hr. TWA
TLV	(ACGIH)	400 ppm	TWA	


**DuPont™ VERTREL® XH specialty fluid**

Version 2.0

Revision Date 02/23/2012

Ref. 130000000666

TLV (ACGIH) 500 ppm STEL

\* 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.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Form : liquid  
 Color : colourless  
 Odor : slight, ether-like  
 pH : neutral  
 Freezing point : < -80.0 °C (< -112.0 °F)  
 Boiling point/boiling range : 53.0 °C (127.4 °F) at 1,013 hPa  
 Vapour Pressure : 202 mm Hg at 25 °C (77 °F)  
 Density : 1.47 g/cm<sup>3</sup> at 25 °C (77 °F)

**SECTION 10. STABILITY AND REACTIVITY**

Stability : No decomposition if stored and applied as directed.  
 Incompatibility : Alkali metals Alkaline earth metals, Powdered metals, Powdered metal salts, Strong bases  
 Hazardous decomposition products : Hazardous decomposition products formed under fire conditions.: Fluorinated hydrocarbons, Hydrogen fluoride, Carbon dioxide (CO<sub>2</sub>), Carbon monoxide

**SECTION 11. TOXICOLOGICAL INFORMATION**

1,1,1,2,2,3,4,5,5,5-Decafluoropentane  
 Dermal LD50 : > 5,000 mg/kg , rabbit  
 Oral LD50 : > 5,000 mg/kg , rat  
 Inhalation 4 h LC50 : 114 mg/l , rat  
 Central nervous system effects  
 Convulsions


**DuPont™ VERTREL® XH specialty fluid**

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Skin irritation	:	No skin irritation, rabbit
Eye irritation	:	No eye irritation, rabbit
Skin sensitization	:	Did not cause sensitization on laboratory animals., guinea pig
Repeated dose toxicity	:	Inhalation rat  No toxicologically significant effects were found.
Mutagenicity	:	Did not cause genetic damage in animals. Did not cause genetic damage in cultured mammalian cells. Did not cause genetic damage in cultured bacterial cells.
Reproductive toxicity	:	Animal testing showed no reproductive toxicity.
Teratogenicity	:	Animal testing showed no developmental toxicity.

## Heptane

Dermal LD50	:	> 3,160 mg/kg , rabbit
Oral LD50	:	> 5,000 mg/kg , rat
Inhalation 4 h LC50	:	104 mg/l , rat
Inhalation	:	animals (unspecified species) Laboured breathing Anaesthetic effects Cardiac sensitization Fluid retention in lungs (pulmonary oedema)
Skin irritation	:	dog Irritation
Repeated dose toxicity	:	animals (unspecified species)  Anaesthetic effects, altered blood chemistry
Carcinogenicity	:	Overall weight of evidence indicates that the substance is not carcinogenic.


**DuPont™ VERTREL® XH specialty fluid**

Version 2.0

Revision Date 02/23/2012

Ref. 13000000666

Mutagenicity : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

**SECTION 12. ECOLOGICAL INFORMATION**
**Aquatic Toxicity**
**1,1,1,2,2,3,4,5,5,5-Decafluoropentane**

96 h LC50 : Oncorhynchus mykiss (rainbow trout) 13.9 mg/l

96 h LC50 : Pimephales promelas (fathead minnow) 27.2 mg/l

96 h LC50 : Danio rerio (zebra fish) 13 mg/l

72 h EC50 : Pseudokirchneriella subcapitata (green algae) &gt; 120 mg/l

48 h LC50 : Daphnia magna (Water flea) 11.7 mg/l

21 d : NOEC Daphnia magna (Water flea) 1.72 mg/l

**Heptane**

96 h LC50 : Fish (unspecified species) 375 mg/l

**Environmental Fate**
**1,1,1,2,2,3,4,5,5,5-Decafluoropentane**

Biodegradability : Not readily biodegradable.

Bioaccumulation : Bioaccumulation is unlikely.

**SECTION 13. DISPOSAL CONSIDERATIONS**

Waste Disposal : Can be used after re-conditioning. If recycling is not practicable, dispose of in compliance with local regulations. The product should not be allowed to enter drains, water courses or the soil.

Environmental Hazards : If recycling is not practicable, dispose of in compliance with local regulations.



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**SECTION 14. TRANSPORT INFORMATION**

Not classified as dangerous in the meaning of transport regulations.

**SECTION 15. REGULATORY INFORMATION**

- TSCA : Listed  
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.
- SARA 313 Regulated Chemical(s) : SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
- California Prop. 65 : Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known
- PA Right to Know Regulated Chemical(s) : Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Heptane



**DuPont™ VERTREL® XH specialty fluid**

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NJ Right to Know : Substances on the New Jersey Workplace Hazardous Substance List  
Regulated Chemical(s) present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Heptane

**SECTION 16. OTHER INFORMATION**

Before use read DuPont's safety information.

For further information contact the local DuPont office or DuPont's nominated distributors.

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