

**DuPont™ VERTREL® X-Si specialty fluid**

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

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® X-Si specialty fluid
MSDS Number	:	13000000717
Product Use	:	Cleaning agent
Manufacturer	:	DuPont 1007 Market Street Wilmington, DE 19898
Product Information	:	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)
Other information	:	professional use

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. May cause cardiac arrhythmia.

Potential Health Effects

Skin

Hexamethyldisiloxane : May cause: Irritation with discomfort or pain, redness or rash, itching or swelling.

Eyes

Hexamethyldisiloxane : May cause: Eye irritation, tearing, Pain, 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® X-Si specialty fluid

Version 2.0

Revision Date 05/21/2012

Ref. 130000000717

Hexamethyldisiloxane : May cause: Respiratory irritation, Cough, Discomfort.

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

Hexamethyldisiloxane : Adverse effects from repeated ingestion may include: Kidney effects Liver effects altered blood chemistry

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	50 - 60 %
Hexamethyldisiloxane	107-46-0	40 - 50 %

SECTION 4. FIRST AID MEASURES

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.


DuPont™ VERTREL® X-Si specialty fluid

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

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	: < -18 °C (< 0 °F) closed cup Method : Pensky-Martens closed cup - PMCC
Lower explosion limit	: 5.0 vol%
Upper explosion limit	: no data available
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
Suitable extinguishing media	: Water spray, Water mist, Dry chemical, Carbon dioxide (CO2)

**DuPont™ VERTREL® X-Si specialty fluid**

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

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



DuPont™ VERTREL® X-Si specialty fluid

Version 2.0

Revision Date 05/21/2012

Ref. 130000000717

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:

* 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.

**DuPont™ VERTREL® X-Si specialty fluid**

Version 2.0

Revision Date 05/21/2012

Ref. 130000000717

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: liquid
Color	: clear, colourless
Odor	: slight, ether-like
pH	: neutral
Melting point/range	: < -50.0 °C (< -58.0 °F)
Boiling point/boiling range	: 57.0 °C (134.6 °F) at 1,013 hPa
Vapour Pressure	: 180 hPa at 25 °C (77 °F) : 715 hPa at 50 °C (122 °F)
Density	: 1.170 g/cm ³ at 25 °C (77 °F)
Water solubility	: at 25 °C (77 °F) slightly soluble
Viscosity	: 0.6 mPa.s 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 ₂), 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
Skin irritation	: No skin irritation, rabbit

**DuPont™ VERTREL® X-Si specialty fluid**

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

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.

Hexamethyldisiloxane

Dermal LD50	:	16, rabbit
Oral LD50	:	> 34,600 mg/kg , rat
Inhalation 4 h LC50	:	105.96 mg/l , rat
Skin irritation	:	slight irritation, rabbit
Eye irritation	:	Mild eye irritation, rabbit
Skin sensitization	:	guinea pig Patch test on human volunteers did not demonstrate sensitization properties.
Repeated dose toxicity	:	Dermal rabbit Skin irritation Dermal rat Reduced body weight gain, Kidney effects, Liver effects Oral - gavage


DuPont™ VERTREL® X-Si specialty fluid

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

rat

Spleen effects, Kidney effects, Pathologic changes, Liver

Inhalation
rat

Liver effects, Kidney effects, Lungs, Testicular effects

Mutagenicity : Did not cause genetic damage in cultured bacterial cells.
Did not cause genetic damage in animals.
Did not cause genetic damage in cultured mammalian cells.

Reproductive toxicity : Evidence suggests the substance is not a reproductive toxin in animals.

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) > 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

Hexamethyldisiloxane

96 h LC50 : Oncorhynchus mykiss (rainbow trout) 3.02 mg/l

Environmental Fate

1,1,1,2,2,3,4,5,5,5-Decafluoropentane

Biodegradability : Not readily biodegradable.


DuPont™ VERTREL® X-Si specialty fluid

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

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.

SECTION 14. TRANSPORT INFORMATION

DOT	UN number	: 1993
	Proper shipping name	: Flammable liquids, n.o.s. (Hexamethyldisiloxane)
	Class	: 3
	Packing group	: II
	Labelling No.	: 3
IATA_C	UN number	: 1993
	Proper shipping name	: Flammable liquid, n.o.s. (Hexamethyldisiloxane)
	Class	: 3
	Packing group	: II
	Labelling No.	: 3
IMDG	UN number	: 1993
	Proper shipping name	: FLAMMABLE LIQUID, N.O.S. (Hexamethyldisiloxane)
	Class	: 3
	Packing group	: II
	Labelling No.	: 3
	Marine pollutant	: yes (Hexamethyldisiloxane)

**DuPont™ VERTREL® X-Si specialty fluid**

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

SECTION 15. REGULATORY INFORMATION

TSCA : 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

SECTION 16. OTHER INFORMATION

Before use read DuPont's safety information.

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

DuPont™ Vertrel® are registered trademarks or trademarks of E. I. du Pont de Nemours and Company or its affiliates.

Contact person : MSDS Coordinator, DuPont Chemicals and Fluoroproducts, Wilmington, DE 19898, (800) 441-7515

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination



DuPont™ VERTREL® X-Si specialty fluid

Version 2.0

Revision Date 05/21/2012

Ref. 13000000717

with any other materials or in any process, unless specified in the text.

Significant change from previous version is denoted with a double bar.