

**DuPont™ Vertrel® XF specialty fluid**

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

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® XF specialty fluid
Tradename/Synonym : Vertrel® 4310
HFC-43-10mee
HFC-4310

Product Use : Cleaning agent

Restrictions on use : For professional users only.

Manufacturer/Supplier : DuPont
1007 Market Street
Wilmington, DE 19898
United States of America

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

Not classified as a hazardous substance or mixture according to the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard 2012.

Other hazards

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., Effects of breathing high concentrations of vapour may include:, May cause cardiac arrhythmia.

Misuse or intentional inhalation abuse may lead to death without warning.

**DuPont™ Vertrel® XF specialty fluid**

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
1,1,1,2,2,3,4,5,5,5-Decafluoropentane	138495-42-8	100 %

SECTION 4. FIRST AID MEASURES

- 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.
- 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.
- 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.
- 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.
- Most important symptoms/effects, acute and delayed : Dizziness
- Protection of first-aiders : If potential for exposure exists refer to Section 8 for specific personal protective equipment.
- Notes to physician : Do not give adrenaline or similar drugs.

**DuPont™ Vertrel® XF specialty fluid**

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray, Water mist, Dry chemical, Carbon dioxide (CO₂)
- Unsuitable extinguishing media : No applicable data available.
- Specific hazards : 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.
- Special protective equipment for firefighters : 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.
- Further information : 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.
- Environmental precautions : 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.
- Spill Cleanup : Contain spillage, and then collect with non-combustible absorbent material,



DuPont™ Vertrel® XF specialty fluid

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

(e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Accidental Release Measures : No applicable data available.

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 dispensing from shipping containers.
- Dust explosion class : No applicable data available.
- 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 period : No applicable data available.
- 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

**DuPont™ Vertrel® XF specialty fluid**

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

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 the Manufacturer'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**Appearance (Physical state, form, colour, etc.)**

Form : liquid
Color : colourless
Odor : slight, ether-like
Odor threshold : No applicable data available.
pH : neutral
Melting point/freezing point : Melting point/range
ca. -84.0 °C (-119.2 °F)
Boiling point/boiling range : Boiling point
55 °C (131 °F)
Flash point : Tag closed cup
Method: ASTM D 56

**DuPont™ Vertrel® XF specialty fluid**

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

does not flash

Evaporation rate	: No applicable data available.
Flammability (solid, gas)	: No applicable data available.
Upper explosion limit	: Method: None per ASTM E681
Lower explosion limit	: Method: None per ASTM E681
Vapor pressure	: 248 hPa at 20 °C (68 °F) : 313 hPa at 25 °C (77 °F) : 854 hPa at 50 °C (122 °F)
Vapour density	: No applicable data available.
Density	: 1.60 g/cm ³ at 20 °C (68 °F)
Density	: 1.58 g/cm ³ at 25 °C (77 °F)
Specific gravity (Relative density)	: No applicable data available.
Bulk density	: No applicable data available.
Water solubility	: ca. 0.10 - 0.14 g/l at 20 °C (68 °F)
Solubility(ies)	: No applicable data available.
Partition coefficient: n-octanol/water	: Pow: 2.7 at 24 °C (75 °F)
Ignition temperature	: no data available
Auto-ignition temperature	: No applicable data available.
Decomposition temperature	: No applicable data available.
Viscosity	: No applicable data available.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Stable at normal ambient temperature and pressure.


DuPont™ Vertrel® XF specialty fluid

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

Chemical stability	:	No decomposition if stored and applied as directed.
Possibility of hazardous reactions	:	No applicable data available.
Conditions to avoid	:	Avoid open flames and high temperatures.
Incompatible materials	:	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, Carbonyl fluoride

SECTION 11. TOXICOLOGICAL INFORMATION

DuPont™ Vertrel® XF specialty fluid		
Further information	:	Inhalation of vapours in high concentration may cause shortness of breath (lung oedema).
1,1,1,2,2,3,4,5,5,5-Decafluoropentane		
Inhalation 4 h LC50	:	114 mg/l , Rat Central nervous system effects Convulsions
Dermal LD50	:	> 5,000 mg/kg , Rabbit
Oral LD50	:	> 5,000 mg/kg , Rat
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	No eye irritation, Rabbit
Skin sensitization	:	Did not cause sensitisation on laboratory animals., Guinea pig
Repeated dose toxicity	:	Inhalation Rat - No toxicologically significant effects were found.
Mutagenicity	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing did not show any mutagenic effects.


DuPont™ Vertrel® XF specialty fluid

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

Reproductive toxicity : No toxicity to reproduction
Animal testing showed no reproductive toxicity.

Teratogenicity : Animal testing showed no developmental toxicity.

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 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

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 methods - : Can be used after re-conditioning. If recycling is not practicable, dispose of in



DuPont™ Vertrel® XF specialty fluid

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

Product : compliance with local regulations. The product should not be allowed to enter drains, water courses or the soil.

Contaminated packaging : If recycling is not practicable, dispose of in compliance with local regulations.

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) : 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
 Chemicals known to the State of California to cause cancer, birth defects or



DuPont™ Vertrel® XF specialty fluid

Version 2.1

Revision Date 01/27/2015

Ref. 130000000559

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.

Revision Date : 01/27/2015

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

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