

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

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 : Vertrel™ SFR specialty fluid  
Product Use : Cleaning agent, For professional users only.

Restrictions on use : Do not use product for anything outside of the above specified uses  
Manufacturer/Supplier : The Chemours Company FC, LLC  
1007 Market Street  
Wilmington, DE 19899  
United States of America

Product Information : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)  
Medical Emergency : 1-866-595-1473 (outside the U.S. 1-302-773-2000)  
Transport Emergency : CHEMTREC: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

**SECTION 2. HAZARDS IDENTIFICATION****Product hazard category**

Acute toxicity (Oral)	Category 4
Serious eye damage/eye irritation	Category 2B
Specific target organ toxicity - single exposure	Category 1
Specific target organ toxicity - single exposure	Category 3



**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

**Label content**

Pictogram

:



Signal word

: Danger

Hazardous warnings

: Harmful if swallowed.  
Causes eye irritation.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
Causes damage to organs. (Central nervous system, Eyes)

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

Hazardous prevention measures : Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.  
Wash skin thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
Use only outdoors or in a well-ventilated area.  
IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF exposed: Call a POISON CENTER or doctor/ physician.  
Rinse mouth.  
If eye irritation persists: Get medical advice/ attention.  
Store in a well-ventilated place. Keep container tightly closed.  
Store locked up.  
Dispose of contents/ container to an approved waste disposal plant.

**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., Central nervous system effects, Convulsions, Misuse or intentional inhalation abuse may lead to death without warning.

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

Component	CAS-No.	Concentration
The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.		
trans-Dichloroethylene	156-60-5	65 - 75 %


**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

1,1,1,2,2,3,4,5,5,5-Decafluoropentane	138495-42-8	15 - 20 %
1,1,2,2,3,3,4-Heptafluorocyclopentane	15290-77-4	10 - 15 %
Methanol	67-56-1	<=2.9 %

**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 : Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention. Remove contact lenses, if present and easy to do. Continue rinsing.
- 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



**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

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. Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

**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 : Fire or intense heat may cause violent rupture of packages. The product is not flammable. Vapours may form flammable mixture with air. Hazardous combustion products: Hydrogen fluoride Fluorinated hydrocarbons Carbonyl fluoride Carbon oxides Hydrogen chloride

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.

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

- 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. Do not allow contact with soil, surface or ground water.
- 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** : 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 immediately after handling the product.
- Handling (Physical Aspects)** : Material should not be dispensed by pouring from pail/drum shipping containers containing 5 gallons or more. The use of a drum pump is recommended for dispensing from pail/drum shipping containers with 5 gallons or more, except for smaller containers where adequate ventilation can be used to manage the exposure.
- Dust explosion class** : Not applicable
- Storage** : Protect from contamination. Drainage facilities should be constructed for containment of small spills. 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.



## Vertrel™ SFR specialty fluid

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

Storage temperature : &lt; 52 °C (&lt; 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

trans-Dichloroethylene				
Permissible exposure limit:	(OSHA)	200 ppm	790 mg/m <sup>3</sup>	8 hr. TWA
TLV	(ACGIH)	200 ppm	TWA	

1,1,1,2,2,3,4,5,5,5-Decafluoropentane  
No applicable data available.

Methanol				
Permissible exposure limit:	(OSHA)	200 ppm	260 mg/m <sup>3</sup>	8 hr. TWA

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

TLV	(ACGIH)	200 ppm	TWA
TLV	(ACGIH)	250 ppm	STEL

## Biological Exposure Indices

Methanol BEI	(ACGIH)	15 mg/l Methanol/Urine Sampling time: End of shift.
-----------------	---------	--

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

## Appearance

Physical state	: liquid
Form	: liquid
Color	: colourless, clear

Odor	: slight, pleasant
------	--------------------

Odor threshold	: No applicable data available.
----------------	---------------------------------

pH	: No applicable data available.
----	---------------------------------

Melting point/freezing point	: Freezing point < -50 °C (< -58 °F)
------------------------------	---

Boiling point/boiling range	: Boiling point/boiling range 41 °C (106 °F)
-----------------------------	---

Flash point	: Method: Pensky-Martens closed cup - PMCC does not flash
-------------	--

Evaporation rate	: No applicable data available.
------------------	---------------------------------

Flammability (solid, gas)	: No applicable data available.
---------------------------	---------------------------------

Upper explosion limit	: 15 vol%
-----------------------	-----------

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

Lower explosion limit	: 7 vol%
Vapor pressure	: 579 hPa at 25 °C (77 °F)
Vapour density	: No applicable data available.
Density	: 1.28 g/cm <sup>3</sup> at 25 °C (77 °F)
Specific gravity (Relative density)	: No applicable data available.
Water solubility	: No applicable data available.
Solubility(ies)	: No applicable data available.
Partition coefficient: n-octanol/water	: No applicable data available.
Auto-ignition temperature	: No applicable data available.
Decomposition temperature	: No applicable data available.
Viscosity, kinematic	: No applicable data available.
Viscosity, dynamic	: No applicable data available.

**SECTION 10. STABILITY AND REACTIVITY**

Reactivity	: Stable at normal ambient temperature and pressure.
Chemical stability	: The product is chemically stable. 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, Nitrogen oxides (NO <sub>x</sub> ), Acids, bases and strong oxidizing agents, Oxygen



## Vertrel™ SFR specialty fluid

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

Hazardous decomposition products : Hazardous decomposition products formed under fire conditions.: Fluorinated hydrocarbons, Hydrogen fluoride, Carbon dioxide (CO<sub>2</sub>), Carbon monoxide, Hydrogen chloride gas, Carbonyl fluoride

### SECTION 11. TOXICOLOGICAL INFORMATION

Vertrel™ SFR specialty fluid

Further information : There is no data available for this product.

trans-Dichloroethylene

Inhalation 4 h LC50 : 95.4 mg/l , Rat  
Target Organs: Central nervous system

Dermal LD50 : > 5,000 mg/kg , Rabbit

Oral LD50 : 7,902 mg/kg , Rat  
Target Organs: Central nervous system  
Central nervous system effects  
Respiratory effects

Skin irritation : Mild skin irritation, Rabbit

Eye irritation : Irritation to eyes, reversing within 7 days, Rabbit

Repeated dose toxicity : Inhalation  
Rat  
- 90 d  
gas  
NOAEL: 4000, Method: OECD Test Guideline 413  
No toxicologically significant effects were found.

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

Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

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

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

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.
Reproductive toxicity	:	No toxicity to reproduction Animal testing showed no reproductive toxicity.
Teratogenicity	:	Animal testing showed no developmental toxicity.
1,1,2,2,3,3,4-Heptafluorocyclopentane		
Inhalation 4 h LC50	:	116 mg/l , Rat Vapour
Dermal LD50	:	> 2,000 mg/kg , Rat
Oral LD50	:	> 2,000 mg/kg , Rat
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	No eye irritation, Rabbit

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

	Skin sensitization	: Does not cause skin sensitisation., Guinea pig
Methanol	Inhalation Acute toxicity estimate	: 3 mg/l , animals (unspecified species) Target Organs: Central nervous system, Eye Central nervous system effects narcosis eye effects
	Dermal Acute toxicity estimate	: 300 mg/kg , animals (unspecified species) Target Organs: Central nervous system, Eye Central nervous system effects narcosis eye effects
	Oral Acute toxicity estimate	: 100 mg/kg , animals (unspecified species) Target Organs: Central nervous system, Eye Central nervous system effects narcosis eye effects
	Skin irritation	: Slight or no skin irritation, Rabbit
	Eye irritation	: slight irritation, Rabbit
	Skin sensitization	: Did not cause sensitisation on laboratory animals., Guinea pig
	Carcinogenicity	: Not classifiable as a human carcinogen. Overall weight of evidence indicates that the substance is not carcinogenic.
	Mutagenicity	: Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Overall weight of evidence indicates that the substance is not mutagenic. Did not cause genetic damage in animals. Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others. Genetic damage in cultured bacterial cells was observed in some



## Vertrel™ SFR specialty fluid

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

laboratory tests but not in others.

Reproductive toxicity : No toxicity to reproduction  
Evidence suggests the substance is not a reproductive toxin in animals.

Teratogenicity : Evidence suggests the substance is not a developmental toxin in animals.

### Carcinogenicity

The carcinogenicity classifications for this product and/or its ingredients have been determined according to HazCom 2012, Appendix A.6. The classifications may differ from those listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or those found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition).

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

#### trans-Dichloroethylene

96 h LC50 : Lepomis macrochirus (Bluegill sunfish) 135 mg/l

72 h EC50 : Pseudokirchneriella subcapitata (green algae) 36.36 mg/l

48 h EC50 : Daphnia magna (Water flea) 220 mg/l

#### 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



## Vertrel™ SFR specialty fluid

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

48 h LC50 : Daphnia magna (Water flea) 11.7 mg/l  
 21 d : NOEC Daphnia magna (Water flea) 1.72 mg/l

1,1,2,2,3,3,4-Heptafluorocyclopentane  
 96 h LC50 : Oncorhynchus mykiss (rainbow trout) 74.2 mg/l  
 72 h NOEC : Selenastrum capricornutum (green algae) 24.9 mg/l  
 48 h EC50 : Daphnia magna (Water flea) 66.3 mg/l

### Methanol

96 h LC50 : Pimephales promelas (fathead minnow) 28,100 mg/l  
 96 h LC50 : Selenastrum capricornutum (green algae) 22,000 mg/l  
 48 h EC50 : Daphnia (water flea) > 10,000 mg/l

### Environmental Fate

1,1,1,2,2,3,4,5,5,5-Decafluoropentane  
 Biodegradability : Not readily biodegradable.  
 Bioaccumulation : Bioaccumulation is unlikely.

1,1,2,2,3,3,4-Heptafluorocyclopentane  
 Biodegradability : 0 %  
 Not readily biodegradable.

### Methanol

Biodegradability : Readily biodegradable  
 Bioaccumulation : Bioaccumulation is unlikely.

Additional ecological information : No data is available on the product itself.

## SECTION 13. DISPOSAL CONSIDERATIONS

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

**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

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.

DOT only - when shipped in packages with > 1470 lbs., use: UN3082, Environmentally Hazardous Substance, Liquid, N.O.S. (Dichloroethylene), 9, PGIII RQ (Dichloroethylene)

**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.

This material contains one or more substances which are subject to a TSCA Section 5 Consent Order or Significant New Use Rule (SNUR).



## Vertrel™ SFR specialty fluid

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

1,1,2,2,3,3,4-Heptafluorocyclopentane (CAS# 15290-77-4)

: 1,1,1,2,2,3,4,5,5,5-Decafluoropentane  
 PMN Number: P-95-0638

SARA 313 Regulated  
 Chemical(s) : trans-Dichloroethylene, Methanol

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):  
 trans-Dichloroethylene, Methanol

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

CERCLA Reportable  
 Quantity : 1471 lbs  
 Based on the percentage composition of this chemical in the product.:  
 trans-Dichloroethylene

California Prop. 65 : WARNING! This product contains a chemical known to the State of California  
 to cause birth defects or other reproductive harm. Methanol

### SECTION 16. OTHER INFORMATION

Vertrel™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC.  
 Chemours™ and the Chemours Logo are trademarks of The Chemours Company.  
 Before use read Chemours safety information. For further information contact the local Chemours office or nominated  
 distributors.

Revision Date : 03/16/2016

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



**Vertrel™ SFR specialty fluid**

Version 3.0

Revision Date 03/16/2016

Ref. 130000033961

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.