

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Vertrel™ XF specialty fluid

SDS-Identcode : 130000000559

Recommended use of the chemical and restrictions on use

Recommended use : Cleaning agent

Restrictions on use : For professional users only.
Do not use or resell Chemours™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Chemours representative.

Manufacturer or supplier's details

Company : Chemours Korea Inc.

Address : 12FL, Majestarcity Tower 1, 12, Seocho-daero 38-gil, Seocho-gu, Seoul 06655, Korea

Telephone : 82-2-2015-5000

Emergency telephone number : 080-880-0454

Telefax : 82-2-2015-5091

2. HAZARDS IDENTIFICATION

GHS Classification

Long-term (chronic) aquatic hazard : Category 3

GHS label elements

Hazard pictograms : Not applicable

Signal word : Not applicable

Hazard statements : H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P273 Avoid release to the environment.

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Disposal:

P501 Dispose of contents/ container according to waste-related laws

Other hazards which do not result in classification

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.

Rapid evaporation of the product may cause frostbite.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	Common Name	CAS-No.	Concentration (% w/w)
Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane	No data available	138495-42-8	>= 90 - <= 100

4. FIRST AID MEASURES

- In case of eye contact : Flush eyes with water as a precaution.
Get medical attention if irritation develops and persists.
- In case of skin contact : Wash with water and soap as a precaution.
Get medical attention if symptoms occur.
- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention if symptoms occur.
Rinse mouth thoroughly with water.
- Most important symptoms and effects, both acute and delayed : May cause cardiac arrhythmia.
Inhalation may provoke the following symptoms:
Dizziness
- Protection of first-aiders : No special precautions are necessary for first aid responders.
- Notes to physician : 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 spe-

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

cial caution.

5. FIREFIGHTING MEASURES

Suitable and unsuitable extinguishing media

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Hydrogen fluoride
carbonyl fluoride
Carbon oxides

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions : Avoid release to the environment.
Prevent further leakage or spillage if safe to do so.
Prevent spreading over a wide area (e.g. by containment or oil barriers).
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.
Clean up remaining materials from spill with suitable absor-

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

bent.

Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.

Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

7. HANDLING AND STORAGE

Technical measures	: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	: Use only with adequate ventilation.
Advice on safe handling	: Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment Take care to prevent spills, waste and minimize release to the environment.
Conditions for safe storage	: Do not expose drums to direct heat or temperature above 46°C (115°F) to avoid pressurizing and possibly distorting the drums. 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. Keep in properly labelled containers. Store in accordance with the particular national regulations.
Materials to avoid	: No special restrictions on storage with other products.
Recommended storage temperature	: < 46 °C
Further information on storage stability	: The product has an indefinite shelf life when stored properly.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-	138495-42-8	TWA	225 ppm 2,320 mg/m3	WEEL

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane				
		STEL	700 ppm 7,217 mg/m3	WEEL

Other ingredients, which are listed in section 3 but not listed in this section, do not have established occupational exposure limit values.

Engineering measures : Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

Personal protective equipment. Among the following personal protective equipment, the PPEs which require safety certification need to be certified by KOSHA.

Respiratory protection : Use respiratory protection (air supplied respirator) unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Filter type : Organic gas and low boiling vapour type

Eye protection : Wear the following personal protective equipment:
Safety glasses

Hand protection

Material : Viton®
Glove thickness : 0.7 mm
Wearing time : 120 min

Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!

Skin and body protection : Skin should be washed after contact.

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Appearance	: liquid
Colour	: colourless
Odour	: slight, ether-like
Odour Threshold	: No data available
pH	: No data available
Melting point/freezing point	: -83.7 °C
Initial boiling point and boiling range	: 53.75 °C (1,013 hPa)
Flash point	: Method: ASTM D 56, Tag closed cup does not flash
Evaporation rate	: No data available
Flammability (solid, gas)	: Not applicable
Flammability (liquids)	: No data available
Upper explosion limit / Upper flammability limit	: Upper flammability limit Method: ASTM E681 None.
Lower explosion limit / Lower flammability limit	: Lower flammability limit Method: ASTM E681 None.
Vapour pressure	: 313 hPa (25 °C)
Solubility(ies) Water solubility	: 0.10 - 0.14 g/l (20 °C)
Relative vapour density	: 8.7
Density	: 1.58 g/cm ³ (25 °C) 1.60 g/cm ³ (20 °C)
Partition coefficient: n-octanol/water	: log Pow: 2.7 (24 °C)

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	
Viscosity, dynamic	: 6.7 mPa.s (25 °C)
Viscosity, kinematic	: No data available
Explosive properties	: Not explosive
Oxidizing properties	: The substance or mixture is not classified as oxidizing.
Molecular weight	: No data available
Particle size	: Not applicable

10. STABILITY AND REACTIVITY

Chemical stability and possibility of hazardous reactions	: Not classified as a reactivity hazard. Stable under normal conditions. None known.
Conditions to avoid	: None known.
Incompatible materials	: None.
Hazardous decomposition products	: No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	: Inhalation Skin contact Ingestion Eye contact
--	--

Health hazard information

Acute toxicity

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

	Method: OECD Test Guideline 401
Acute inhalation toxicity	: LC50 (Rat): 114.428 mg/l Exposure time: 4 h Test atmosphere: vapour Method: OECD Test Guideline 403
	No observed adverse effect concentration (Dog): 5000 ppm Test atmosphere: gas Method: Cardiac sensitisation study
	Lowest observed adverse effect concentration (Dog): > 5000 ppm Test atmosphere: gas Method: Cardiac sensitisation study
	Cardiac sensitisation threshold limit (Dog): > 51,544 mg/m3 Test atmosphere: gas Method: Cardiac sensitisation study
Acute dermal toxicity	: LD50 (Rabbit): > 5,000 mg/kg Method: OECD Test Guideline 402

Skin corrosion/irritation

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: No skin irritation

Serious eye damage/eye irritation

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Species	: Rabbit
Result	: No eye irritation
Method	: OECD Test Guideline 405

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Respiratory or skin sensitisation

Respiratory sensitisation

|| No data available

Skin sensitisation

|| No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Test Type	: Buehler Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative

Carcinogenicity

|| No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

|| No data available

Germ cell mutagenicity

|| No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

|| No data available

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES)
		Method: OECD Test Guideline 471
		Result: negative

	:	Test Type: In vitro mammalian cell gene mutation test
		Method: OECD Test Guideline 476
		Result: negative

Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
----------------------	---	--

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Species: Rat
Application Route: inhalation (vapour)
Method: OECD Test Guideline 474
Result: negative

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen.

Reproductive toxicity

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

No data available

Effects on fertility : Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapour)
Method: OECD Test Guideline 415
Result: negative

Effects on foetal development : Test Type: Prenatal development toxicity study (teratogenicity)
Species: Rat
Application Route: inhalation (vapour)
Method: OECD Test Guideline 414
Result: negative

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity

STOT - single exposure

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Exposure routes : Ingestion
Assessment : No significant health effects observed in animals at concentrations of 2000 mg/kg bw or less

Exposure routes : Skin contact
Assessment : No significant health effects observed in animals at concentrations of 2000 mg/kg bw or less

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Exposure routes : inhalation (vapour)
Assessment : No significant health effects observed in animals at concentrations of 20 mg/l/4h or less

STOT - repeated exposure

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Exposure routes : inhalation (vapour)
Assessment : No significant health effects observed in animals at concentrations of 1 mg/l/6h/d or less.

Repeated dose toxicity

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Species : Rat, male and female
NOAEL : 15.463 mg/l
LOAEL : 20.618 mg/l
Application Route : inhalation (vapour)
Exposure time : 90 Days
Method : OECD Test Guideline 413

Aspiration toxicity

No data available

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

No aspiration toxicity classification

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Further information

No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Toxicity to fish	: LC50 (Danio rerio (zebra fish)): 13 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 10.6 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: EC50 (Selenastrum capricornutum (green algae)): > 120 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Scenedesmus capricornutum (fresh water algae)): 120 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 1.72 mg/l Exposure time: 21 d Method: OECD Test Guideline 211

Persistence and degradability

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Biodegradability	: Result: Not readily biodegradable. Method: OECD Test Guideline 301D
------------------	--

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Bioaccumulative potential

Components:

Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 2.4 (24 °C)

Mobility in soil

No data available

Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of contents and container according to wastes control act.

Do not dispose of waste into sewer.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

Disposal precautions

Dispose of contents and container according to wastes control act.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : Not applicable
Proper shipping name : Not applicable
Class : Not applicable
Subsidiary risk : Not applicable
Packing group : Not applicable
Labels : Not applicable

IATA-DGR

UN/ID No. : Not applicable
Proper shipping name : Not applicable
Class : Not applicable

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Subsidiary risk : Not applicable
Packing group : Not applicable
Labels : Not applicable
Packing instruction (cargo aircraft) : Not applicable
Packing instruction (passenger aircraft) : Not applicable

IMDG-Code

UN number : Not applicable
Proper shipping name : Not applicable
Class : Not applicable
Subsidiary risk : Not applicable
Packing group : Not applicable
Labels : Not applicable
EmS Code : Not applicable
Marine pollutant : Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

Refer to section 15 for specific national regulation.

Special precautions for user

Not applicable

15. REGULATORY INFORMATION

National regulatory information

Regulation under the Occupational Safety and Health Act

Harmful Substances Prohibited from Manufacturing

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Harmful Agents to be kept below Occupational Exposure Limits

Not applicable

Harmful Agents Required to be kept below Permission Levels

Not applicable

Hazardous substances requiring management

Not applicable

Special Management Materials

Not applicable

Controlled Substances Subject to Environment Monitoring

Not applicable

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Controlled Substances Subject to Health Examination

Not applicable

Hazardous Substances Subject to Process Safety Management (PSM) Reporting Obligation

Not applicable

Regulation under the Chemicals Control Act

Toxic Chemicals

Not applicable

Restricted Chemicals

Not applicable

Prohibited Chemicals

Not applicable

Toxic Release Inventory

Chemical name	CAS-No.	Group	Threshold limits (%)
Hydrofluorocarbons	138495-42-8	Group II	>= 1 %

Accident Precaution Chemicals

Not applicable

Dangerous Substances Safety Management Act

Not Applicable to Dangerous Materials

Wastes Control Act

Industrial general wastes

Follow article 13 of the act to dispose the product waste

Other requirements in domestic and other countries

Montreal Protocol : Reaction mass of (3R,4R)-1,1,1,2,2,3,4,5,5,5-decafluoropentane and (3S,4S)- 1,1,1,2,2,3,4,5,5,5-decafluoropentane

16. OTHER INFORMATION

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.

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

Further information

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Issuing date : 2017/02/27

Revision number and date

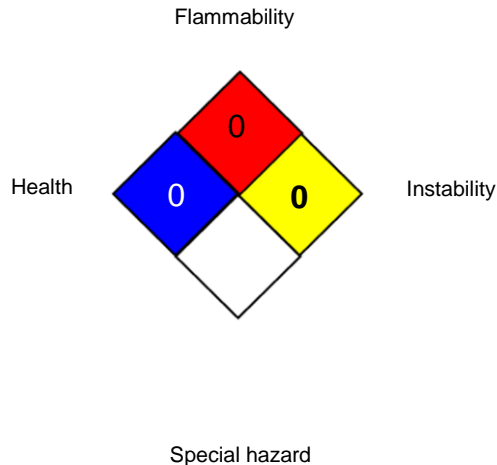
Number of Revision : 51

Revision Date : 2023/11/08

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Date format : yyyy/mm/dd

NFPA:



Full text of other abbreviations

WEEL : Workplace Environmental Exposure Levels (WEEL)

WEEL / STEL : Short term exposure limit

WEEL / TWA : 8-hr TWA

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized Sys-

SAFETY DATA SHEET



Vertrel™ XF specialty fluid

Version 10.0	Revision Date: 2023/11/08	SDS Number (Internal): 1326713-00052	MSDS number: AA00152-0000000559 Date of last issue: 2023/09/13 Date of first issue: 2017/02/27
-----------------	------------------------------	---	--

tem; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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 is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

KR / EN