# SAFETY DATA SHEET

According to REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758

# Opteon™ XP10 (R-513A) Refrigerant

| Version | Revision Date: | SDS Number: | Date of last issue: 23.12.2024 |
|---|---|---|---|
| 3.8 | 23.01.2025 | 9710390-00011 | Date of first issue: 23.09.2021 |

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Trade name : Opteon™ XP10 (R-513A) Refrigerant

SDS-Identcode : 130000051352

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Sub-stance/Mixture : Refrigerant

Recommended restrictions on use : Consumer use, For professional users only.

### 1.3 Details of the supplier of the safety data sheet

Company : Chemours Netherlands B.V.
Baanhoekweg 22
3313 LA Dordrecht Netherlands

Telephone : +31-(0)-78-630-1011

Telefax : +31-78-6163737

E-mail address of person responsible for the SDS : sds-support@chemours.com

### 1.4 Emergency telephone number

+(44)-870-8200418 (CHEMTREC - Recommended)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)**

| | |
|---|---|
| Gases under pressure, Liquefied gas | H280: Contains gas under pressure; may explode if heated. |

### 2.2 Label elements

**Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)**

Hazard pictograms :

Signal word : Warning

Hazard statements : H280 Contains gas under pressure; may explode if heated.

Precautionary statements : **Storage:**

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

**Additional Labelling**

Contains fluorinated greenhouse gases. (HFC-1234yf, HFC-134a)

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.
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.
May displace oxygen and cause rapid suffocation.

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

**Components**

| Chemical name | CAS-No.<br>EC-No.<br>Index-No.<br>Registration number | Classification | Concentration (% w/w) |
|---|---|---|---|
| 2,3,3,3-Tetrafluoropropene# | 754-12-1<br>468-710-7<br>01-0000019665-61 | Flam. Gas 1B; H221<br>Press. Gas Liquefied gas; H280 | 56 |
| 1,1,1,2-Tetrafluoroethane# | 811-97-2<br>212-377-0<br>01-2119459374-33 | Press. Gas Liquefied gas; H280 | 44 |

For explanation of abbreviations see section 16.
#: Voluntarily-disclosed substance

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders : No special precautions are necessary for first aid responders.

If inhaled : If inhaled, remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Get medical attention immediately.

In case of skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area.
Get medical attention immediately.

In case of eye contact : Get medical attention immediately.

If swallowed : Ingestion is not considered a potential route of exposure.

### 4.2 Most important symptoms and effects, both acute and delayed

Symptoms : May cause cardiac arrhythmia.

Other symptoms potentially related to misuse or inhalation abuse are
Cardiac sensitisation
Anaesthetic effects
Light-headedness
Dizziness
confusion
Lack of coordination
Drowsiness
Unconsciousness

Skin contact may provoke the following symptoms:
Irritation
Swelling of tissue
Itching
Discomfort
Redness

Eye contact may provoke the following symptoms
tearing
Redness
Discomfort

Risks : Gas reduces oxygen available for breathing.
Contact with liquid or refrigerated gas can cause cold burns

and frostbite.

### 4.3 Indication of any immediate medical attention and special treatment needed

Treatment : 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

### 5.1 Extinguishing media

Suitable extinguishing media : Not applicable
Will not burn

Unsuitable extinguishing media : Not applicable
Will not burn

### 5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Exposure to combustion products may be a hazard to health.
If the temperature rises there is danger of the vessels bursting due to the high vapor pressure.

Hazardous combustion products : Hydrogen fluoride
Fluorine compounds
Carbon oxides
carbonyl fluoride

### 5.3 Advice for firefighters

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

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

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Evacuate personnel to safe areas.
Avoid skin contact with leaking liquid (danger of frostbite).
Ventilate the area.
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

### 6.2 Environmental precautions

Environmental precautions : Avoid release to the environment.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.

### 6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Ventilate the area.
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.

### 6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Technical measures : Use equipment rated for cylinder pressure. Use a backflow preventative device in piping. Close valve after each use and when empty.

Local/Total ventilation : Use only with adequate ventilation.

Advice on safe handling : Avoid breathing gas.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Wear cold insulating gloves/ face shield/ eye protection.
Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point.
Prevent backflow into the gas tank.
Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.
Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems.
Close valve after each use and when empty. Do NOT change or force fit connections.
Prevent the intrusion of water into the gas tank.
Never attempt to lift cylinder by its cap.
Do not drag, slide or roll cylinders.
Use a suitable hand truck for cylinder movement.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment.

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.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Do not store near combustible materials. Avoid area where salt or other corrosive materials are present. Keep in properly labelled containers. Keep in a cool, well-ventilated place. Keep away from direct sunlight. Store in accordance with the particular national regulations.

Advice on common storage : Do not store with the following product types:
Self-reactive substances and mixtures
Organic peroxides
Oxidizing agents
Flammable liquids
Flammable solids
Pyrophoric liquids
Pyrophoric solids
Self-heating substances and mixtures
Substances and mixtures, which in contact with water, emit flammable gases
Explosives
Very acutely toxic substances and mixtures
Acutely toxic substances and mixtures
Substances and mixtures with chronic toxicity

Storage period : > 10 yr

Recommended storage temperature : < 52 °C

Further information on storage stability : The product has an indefinite shelf life when stored properly.

### 7.3 Specific end use(s)

Specific use(s) : No data available

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

**Occupational Exposure Limits**

| Components | CAS-No. | Value type (Form of exposure) | Control parameters | Basis |
|---|---|---|---|---|
| 1,1,1,2-Tetrafluoroethane | 811-97-2 | TWA | 1,000 ppm<br>4,240 mg/m3 | GB EH40 |

**Derived No Effect Level (DNEL)**

| Substance name | End Use | Exposure routes | Potential health effects | Value |
|---|---|---|---|---|
| 2,3,3,3-Tetrafluoropropene | Workers | Inhalation | Long-term systemic effects | 950 mg/m3 |
| 1,1,1,2-Tetrafluoroethane | Workers | Inhalation | Long-term systemic effects | 13936 mg/m3 |
| | Consumers | Inhalation | Long-term systemic effects | 2476 mg/m3 |

**Predicted No Effect Concentration (PNEC)**

| Substance name | Environmental Compartment | Value |
|---|---|---|
| 2,3,3,3-Tetrafluoropropene | Fresh water | 0.1 mg/l |
| | Intermittent use/release | 1 mg/l |
| | Fresh water sediment | 1.51 mg/kg dry weight (d.w.) |
| | Soil | 1.49 mg/kg dry weight (d.w.) |
| | Marine water | 0.01 mg/l |
| | Marine sediment | 0.151 mg/kg dry weight (d.w.) |
| 1,1,1,2-Tetrafluoroethane | Fresh water | 0.1 mg/l |
| | Marine water | 0.01 mg/l |
| | Intermittent use/release | 1 mg/l |
| | Fresh water sediment | 0.75 mg/kg dry weight (d.w.) |
| | Sewage treatment plant | 73 mg/l |

## 8.2 Exposure controls

**Engineering measures**

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

**Personal protective equipment**

Eye/face protection : Wear the following personal protective equipment:
Chemical resistant goggles must be worn.
Face-shield
Equipment should conform to BS EN 166

Hand protection
Material : Low temperature resistant gloves

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. |
| Respiratory protection | : | If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.<br>Equipment should conform to BS EN 14387 |
| Filter type | : | Organic gas and low boiling vapour type (AX) |
| Protective measures | : | Wear cold insulating gloves/ face shield/ eye protection. |

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| Appearance | : | Liquefied gas |
| Colour | : | colourless |
| Odour | : | slight, ether-like |
| Odour Threshold | : | No data available |
| pH | : | No data available |
| Melting point/freezing point | : | No data available |
| Initial boiling point and boiling range | : | -29.2 °C |
| Flash point | : | Not applicable |
| Evaporation rate | : | > 1<br>(CCL4=1.0) |
| Flammability (solid, gas) | : | Will not burn |
| Upper explosion limit / Upper flammability limit | : | Upper flammability limit<br>Method: ASTM E681<br>None. |
| Lower explosion limit / Lower flammability limit | : | Lower flammability limit<br>Method: ASTM E681<br>None. |
| Vapour pressure | : | 7,063.6 hPa (25 °C) |
| Relative vapour density | : | 3.83<br>(Air = 1.0) |
| Relative density | : | 1.17 (25 °C) |

Solubility(ies)
Water solubility : No data available

Partition coefficient: n-octanol/water : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity
Viscosity, kinematic : Not applicable

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

### 9.2 Other information

Particle size : Not applicable

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Not classified as a reactivity hazard.

### 10.2 Chemical stability

Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : Can react with strong oxidizing agents.

### 10.4 Conditions to avoid

Conditions to avoid : This substance is not flammable in air at temperatures up to 100 °C (212 °F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. This substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing this substance and air, or this substance in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example this substance should NOT be mixed with air under pressure for leak testing or other purposes.

Heat, flames and sparks.

### 10.5 Incompatible materials

Materials to avoid : Avoid impurities (e.g. rust, dust, ash), risk of decomposition.
Incompatible with acids and bases.
Incompatible with oxidizing agents.
Oxygen
Peroxides
peroxide compounds
Powdered metals

### 10.6 Hazardous decomposition products

No hazardous decomposition products are known.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

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

**Acute toxicity**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

Acute inhalation toxicity : LC50 (Rat): > 405800 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 120000 ppm
Test atmosphere: gas
Remarks: Cardiac sensitisation

Lowest observed adverse effect concentration (Dog): > 120000 ppm
Test atmosphere: gas
Remarks: Cardiac sensitisation

Cardiac sensitisation threshold limit (Dog): > 559,509 mg/m3
Test atmosphere: gas
Remarks: Cardiac sensitisation

**1,1,1,2-Tetrafluoroethane:**

Acute oral toxicity : Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 567000 ppm

Exposure time: 4 h
Test atmosphere: gas
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 40000 ppm
Test atmosphere: gas
Remarks: Cardiac sensitisation

Lowest observed adverse effect concentration (Dog): 80000 ppm
Test atmosphere: gas
Symptoms: May cause cardiac arrhythmia.

Cardiac sensitisation threshold limit (Dog): 334,000 mg/m3
Test atmosphere: gas
Symptoms: May cause cardiac arrhythmia.

Acute dermal toxicity : Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

Result : No skin irritation

**1,1,1,2-Tetrafluoroethane:**

Result : No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

Result : No eye irritation

**1,1,1,2-Tetrafluoroethane:**

Result : No eye irritation

**Respiratory or skin sensitisation**

**Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Exposure routes | : | Skin contact |
| Result | : | negative |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Exposure routes | : | Skin contact |
| Result | : | negative |
| Exposure routes | : | Inhalation |
| Species | : | Rat |
| Result | : | negative |
| Exposure routes | : | Inhalation |
| Species | : | Humans |
| Result | : | negative |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

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

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: inhalation (gas)
Method: OECD Test Guideline 474
Result: negative

Test Type: In vivo mammalian alkaline comet assay
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 489
Result: negative

Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 474
Result: negative

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

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Genotoxicity in vitro | : | Test Type: Bacterial reverse mutation assay (AMES)<br>Method: OECD Test Guideline 471<br>Result: negative<br><br>Test Type: Chromosome aberration test in vitro<br>Method: OECD Test Guideline 473<br>Result: negative |
| Genotoxicity in vivo | : | Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)<br>Species: Mouse<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 474<br>Result: negative<br><br>Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo<br>Species: Rat<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 486<br>Result: negative |
| Germ cell mutagenicity- Assessment | : | Weight of evidence does not support classification as a germ cell mutagen. |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Result | : | negative |
| Carcinogenicity - Assessment | : | Weight of evidence does not support classification as a carcinogen |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Species | : | Rat |
| Application Route | : | inhalation (gas) |
| Exposure time | : | 2 Years |
| Method | : | OECD Test Guideline 453 |
| Result | : | negative |
| Carcinogenicity - Assessment | : | Weight of evidence does not support classification as a carcinogen |

**Reproductive toxicity**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Effects on fertility | : | Test Type: Two-generation reproduction toxicity study<br>Species: Rat<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 416<br>Result: negative |
| Effects on foetal development | : | Test Type: Prenatal development toxicity study (teratogenicity)<br>Species: Rat<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 414<br>Result: negative |
| Reproductive toxicity - Assessment | : | Weight of evidence does not support classification for reproductive toxicity, No effects on or via lactation |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Effects on fertility | : | Species: Mouse<br>Application Route: Inhalation<br>Result: negative |
| Effects on foetal development | : | Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test<br>Species: Rabbit<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 414<br>Result: negative |
| Reproductive toxicity - Assessment | : | Weight of evidence does not support classification for reproductive toxicity |

**STOT - single exposure**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Exposure routes | : | inhalation (gas) |
| Assessment | : | No significant health effects observed in animals at concentrations of 20000 ppmV/4h or less |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Exposure routes | : | inhalation (gas) |
| Assessment | : | No significant health effects observed in animals at concentrations of 20000 ppmV/4h or less |

**STOT - repeated exposure**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Exposure routes | : | inhalation (gas) |
| Assessment | : | No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less. |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Exposure routes | : | inhalation (gas) |
| Assessment | : | No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less. |

**Repeated dose toxicity**

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| NOAEL | : | 50000 ppm |
| LOAEL | : | >50000 ppm |
| Application Route | : | inhalation (gas) |
| Exposure time | : | 13 Weeks |
| Method | : | OECD Test Guideline 413 |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| NOAEL | : | 50000 ppm |
| LOAEL | : | >50000 ppm |
| Application Route | : | inhalation (gas) |
| Exposure time | : | 2 yr |
| Method | : | OECD Test Guideline 453 |

**Aspiration toxicity**

Not classified based on available information.

**Components:**

**2,3,3,3-Tetrafluoropropene:**

No aspiration toxicity classification

**1,1,1,2-Tetrafluoroethane:**

No aspiration toxicity classification

## SECTION 12: Ecological information

### 12.1 Toxicity

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Cyprinus carpio (Carp)): > 197 mg/l<br>Exposure time: 96 h<br>Method: OECD Test Guideline 203 |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): > 100 mg/l<br>Exposure time: 48 h<br>Method: OECD Test Guideline 202 |
| Toxicity to algae/aquatic plants | : | EC50 (Selenastrum capricornutum (green algae)): > 100 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br><br>NOEC (Selenastrum capricornutum (green algae)): > 75 mg/l<br>Exposure time: 3 d<br>Method: OECD Test Guideline 201 |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l<br>Exposure time: 96 h<br>Method: Regulation (EC) No. 440/2008, Annex, C.1 |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 980 mg/l<br>Exposure time: 48 h<br>Method: Regulation (EC) No. 440/2008, Annex, C.2 |
| Toxicity to algae/aquatic plants | : | ErC50 (green algae): > 100 mg/l<br>Exposure time: 96 h<br>Remarks: Based on data from similar materials |

### 12.2 Persistence and degradability

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Biodegradability | : | Result: Not readily biodegradable.<br>Method: OECD Test Guideline 301F |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Biodegradability | : | Result: Not readily biodegradable.<br>Method: OECD Test Guideline 301D |

### 12.3 Bioaccumulative potential

**Components:**

**2,3,3,3-Tetrafluoropropene:**

| | | |
|---|---|---|
| Bioaccumulation | : | Remarks: Bioaccumulation is unlikely. |
| Partition coefficient: n-octanol/water | : | log Pow: 2 (25 °C) |

**1,1,1,2-Tetrafluoroethane:**

| | | |
|---|---|---|
| Bioaccumulation | : | Remarks: Bioaccumulation is unlikely. |
| Partition coefficient: n-octanol/water | : | log Pow: 1.06 |

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

**Product:**

| | | |
|---|---|---|
| Assessment | : | This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. |

### 12.6 Other adverse effects

**Product:**

| | | |
|---|---|---|
| Endocrine disrupting potential | : | This substance/mixture does not contain components considered to have endocrine disrupting properties for environment according to UK REACH Article 57(f). |

Regulation (EU) No 2024/573 on fluorinated greenhouse gases

**Product:**

100-year global warming potential: 629

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

| | | |
|---|---|---|
| Product | : | Dispose of in accordance with local regulations.<br>According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.<br>Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities. |
| Contaminated packaging | : | Empty containers should be taken to an approved waste han- |

dling site for recycling or disposal.
Empty pressure vessels should be returned to the supplier.
If not otherwise specified: Dispose of as unused product.

## SECTION 14: Transport information

### 14.1 UN number

| | | |
|---|---|---|
| **ADN** | : | UN 1078 |
| **ADR** | : | UN 1078 |
| **RID** | : | UN 1078 |
| **IMDG** | : | UN 1078 |
| **IATA** | : | UN 1078 |

### 14.2 UN proper shipping name

| | | |
|---|---|---|
| **ADN** | : | REFRIGERANT GAS, N.O.S. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane) |
| **ADR** | : | REFRIGERANT GAS, N.O.S. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane) |
| **RID** | : | REFRIGERANT GAS, N.O.S. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane) |
| **IMDG** | : | REFRIGERANT GAS, N.O.S. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane) |
| **IATA** | : | Refrigerant gas, n.o.s. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane) |

### 14.3 Transport hazard class(es)

| | | Class | Subsidiary risks |
|---|---|---|---|
| **ADN** | : | 2 | 2.2 |
| **ADR** | : | 2 | 2.2 |
| **RID** | : | 2 | 2.2, (13) |
| **IMDG** | : | 2.2 | |
| **IATA** | : | 2.2 | |

### 14.4 Packing group

**ADN**

| | | |
|---|---|---|
| Packing group | : | Not assigned by regulation |
| Classification Code | : | 2A |
| Hazard Identification Number | : | 20 |
| Labels | : | 2.2 |

**ADR**

| | | |
|---|---|---|
| Packing group | : | Not assigned by regulation |
| Classification Code | : | 2A |
| Hazard Identification Number | : | 20 |

Labels : 2.2
Tunnel restriction code : (C/E)

**RID**
Packing group : Not assigned by regulation
Classification Code : 2A
Hazard Identification Number : 20
Labels : 2.2 ((13))

**IMDG**
Packing group : Not assigned by regulation
Labels : 2.2
EmS Code : F-C, S-V

**IATA (Cargo)**
Packing instruction (cargo aircraft) : 200
Packing group : Not assigned by regulation
Labels : Non-flammable, non-toxic Gas

**IATA (Passenger)**
Packing instruction (passenger aircraft) : 200
Packing group : Not assigned by regulation
Labels : Non-flammable, non-toxic Gas

### 14.5 Environmental hazards

**ADN**
Environmentally hazardous : no

**ADR**
Environmentally hazardous : no

**RID**
Environmentally hazardous : no

**IMDG**
Marine pollutant : no

### 14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Remarks : Not applicable for product as supplied.

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant EU provisions transposed through retained EU law

UK REACH List of restrictions (Annex 17) : Not applicable

| | | |
|---|---|---|
| UK REACH Candidate list of substances of very high concern (SVHC) for Authorisation | : | Not applicable |
| The Persistent Organic Pollutants Regulations (retained Regulation (EU) 2019/1021 as amended for Great Britain) | : | Not applicable |
| Regulation (EU) No 2024/590 on substances that deplete the ozone layer | : | Not applicable |
| UK REACH List of substances subject to authorisation (Annex XIV) | : | Not applicable |
| GB Export and import of hazardous chemicals - Prior Informed Consent (PIC) Regulation | : | Not applicable |

Control of Major Accident Hazards Regulations 2015 (COMAH)

| | | Quantity 1 | Quantity 2 |
|---|---|---|---|
| 18 | Liquefied flammable gases (including LPG) and natural gas | 50 t | 200 t |

**15.2 Chemical safety assessment**

Chemical Safety Assessments have been carried out for these substances.

## SECTION 16: Other information

Other information : Opteon™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC.
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For further information contact the local Chemours office or nominated distributors.

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

**Full text of H-Statements**

| | | |
|---|---|---|
| H221 | : | Flammable gas. |
| H280 | : | Contains gas under pressure; may explode if heated. |

**Full text of other abbreviations**

| | | |
|---|---|---|
| Flam. Gas | : | Flammable gases |
| Press. Gas | : | Gases under pressure |
| GB EH40 | : | UK. EH40 WEL - Workplace Exposure Limits |
| GB EH40 / TWA | : | Long-term exposure limit (8-hour TWA reference period) |

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by

Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; 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; GHS - Globally Harmonized System; 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; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; 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

**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/ |

| **Classification of the mixture:** | | **Classification procedure:** |
|---|---|---|
| Press. Gas Liquefied gas | H280 | Based on product data or assessment |

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.

GB / EN