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Signal word: warning

Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

Precautionary Statements

Storage

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

Hazardous ingredients for labeling

1,1,1,2-Tetrafluoroethane (R 134a), Difluoromethane (R 32), Pentafluoroethane (R 125)

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.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 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**3.1. Substances**

not applicable

3.2. Mixtures**Hazardous ingredients**

CAS No	EC No	Name	[% weight]	Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]
811-97-2	212-377-0	1,1,1,2-Tetrafluoroethane (R 134a)	52	Liq. Gas, H280
354-33-6	206-557-8	Pentafluoroethane (R 125)	25	Liq. Gas, H280
75-10-5	200-839-4	Difluoromethane (R 32)	23	Flam.Gas1, H220 / Liq.Gas, H280

REACH

CAS No	Name	REACH registration number
811-97-2	1,1,1,2-Tetrafluoroethane (R 134a)	01-2119459374-33
354-33-6	Pentafluoroethane (R 125)	01-2119485636-25
75-10-5	Difluoromethane (R 32)	01-2119471312-47

SECTION 4: First aid measures**4.1. Description of first aid measures****General information**

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.

In case of inhalation

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

In case of contact with skin wash off with warm water.

In case of frostbite rinse with plenty of water. Don't remove clothing.

In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin. Thaw it with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call for a doctor immediately.

In case of ingestion

Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed Physician's information / possible symptoms

The following symptoms may occur in case of strong exposition:

Unconsciousness

Cardiac arrhythmia (disordered cardiac rhythm).

Headache

Nausea

Confusion

Dizziness

Contact with liquid may cause cold burns/frostbite.

Physician's information / possible dangers

Long-term inhaling of separation products may cause pulmonary oedema.

4.3. Indication of any immediate medical attention and special treatment needed Treatment (Advice to doctor)

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

Unsuitable extinguishing media

Not applicable

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. Use personal protective equipment.

Hazardous combustion products

Hydrogen fluoride
Carbonyl fluoride
Carbon oxides
Fluorine compounds

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

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.
 Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.
 Prevent backflow into the gas tank.
 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)

Recommendation(s) for intended use

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.

SECTION 8: Exposure controls/personal protection

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
1,1,1,2-Tetrafluoroethane	Workers	Inhalation	Long-term systemic effects	13936 mg/m3
	Consumers	Inhalation	Long-term systemic effects	2476 mg/m3
Pentafluoroethane	Workers	Inhalation	Long-term systemic effects	16444 mg/m3
	Consumers	Inhalation	Long-term systemic effects	1753 mg/m3
Difluoromethane	Workers	Inhalation	Long-term systemic effects	7035 mg/m3
	Consumers	Inhalation	Long-term systemic effects	750 mg/m3

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
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

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Pentafluoroethane	Fresh water	0.1 mg/l
	Freshwater - intermittent	1 mg/l
	Fresh water sediment	0.6 mg/kg dry weight (d.w.)
Difluoromethane	Fresh water	0.142 mg/l
	Intermittent use/release	1.42 mg/l
	Fresh water sediment	0.534 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

Ensure adequate ventilation, especially in confined areas.

Minimize workplace exposure concentrations.

Personal protective equipment

Eye protection: Wear the following personal protective equipment:
 Chemical resistant goggles must be worn.
 Face-shield
 Equipment should conform to I.S. 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.
 Equipment should conform to I.S. 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

Physical state:	Liquefied gas
Colour:	Colourless
Odour:	Slight, ether-like
Odour Threshold:	No data available
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	-43.6 °C
Flammability (solid, gas):	Will not burn
Upper explosion limit / Upper flammability limit:	Upper flammability limit
Method:	ASTM E681
	None.
Lower explosion limit / Lower flammability limit:	Lower flammability limit

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Method:	ASTM E681 None.
Flash point:	Not applicable
Auto-ignition temperature:	685 °C
Decomposition temperature:	No data available
pH:	No data available
Viscosity	
Viscosity, kinematic:	Not applicable
Solubility(ies)	
Water solubility:	No data available
Partition coefficient: n- octanol/water:	Not applicable
Vapour pressure:	11,903 hPa (25 °C)
Relative density:	1.14 (25 °C)
Density:	1.136 g/cm ³ (25 °C) (as liquid)
Relative vapour density:	No data available
Particle characteristics	
Particle size:	Not applicable

9.2 Other information

Explosives:	Not explosive
Oxidizing properties:	The substance or mixture is not classified as oxidizing.
Evaporation rate:	Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

See section "Possibility of hazardous reactions".

10.2 Chemical stability

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

10.3 Possibility of hazardous reactions

Can react with strong oxidizing agents.

10.4 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: Oxidizing agents

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on hazard classes

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

Not classified based on available information.

Components:**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.

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

Pentafluoroethane:

Acute inhalation toxicity: LC50 (Rat): > 800000 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 75000 ppm
Remarks: Cardiac sensitisation

Cardiac sensitisation threshold limit (Dog): 368.159 mg/m3
Remarks: Cardiac sensitisation

Difluoromethane:

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

Acute inhalation toxicity: LC50 (Rat): > 520000 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 350000 ppm
Test atmosphere: gas
Remarks: Cardiac sensitisation

Lowest observed adverse effect concentration (Dog): >350000 ppm
Test atmosphere: gas

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Remarks: Cardiac sensitisation

Cardiac sensitisation threshold limit (Dog): > 735,000 mg/m³

Test atmosphere: gas

Remarks: Cardiac sensitisation

Acute dermal toxicity:

Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Not classified based on available information.

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

Result: No skin irritation

Difluoromethane:

Result: No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

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

Result: No eye irritation

Difluoromethane:

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:**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

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Difluoromethane:

Exposure routes: Skin contact

Result: negative

Exposure routes: Inhalation

Result: negative

Germ cell mutagenicity

Not classified based on available information.

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

Genotoxicity in vitro:

Test Type: Bacterial reverse mutation assay (AMES)

Method: OECD Test Guideline 471

Result: negative

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: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo

Species: Rat

Application Route: inhalation (gas)

Method: OECD Test Guideline 486

Result: negative

Germ cell mutagenicity- Assessment:

Weight of evidence does not support classification as a germ cell mutagen.

Pentafluoroethane:

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

Result: negative

Remarks: Based on data from similar materials

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)

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Species: Mouse
Application Route: inhalation (gas)
Method: OECD Test Guideline 474

Result: negative

Difluoromethane:

Genotoxicity in vitro:

Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471

Result: negative

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

Germ cell mutagenicity- Assessment:

Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Not classified based on available information.

Components:

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

Difluoromethane:

Carcinogenicity – Assessment:

Weight of evidence does not support classification as a carcinogen

Reproductive toxicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Effects on fertility:

Species: Mouse

Application Route: Inhalation

Result: negative

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Effects on foetal development:

Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test

Species: Rabbit

Application Route: inhalation (gas)

Method: OECD Test Guideline 414

Result: negative

Reproductive toxicity – Assessment:

Weight of evidence does not support classification for reproductive toxicity

Pentafluoroethane:

Effects on fertility:

Test Type: One-generation reproduction toxicity study

Species: Rat

Application Route: inhalation (vapour)

Result: negative

Remarks: Based on data from similar materials

Effects on foetal development:

Test Type: Embryo-foetal development

Species: Rat

Application Route: inhalation (gas)

Method: OECD Test Guideline 414

Result: negative

Difluoromethane:

Effects on fertility:

Species: Mouse

Application Route: Inhalation

Result: negative

Remarks: Based on data from similar materials

Effects on foetal development:

Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test

Species: Rat

Application Route: inhalation (gas)

Method: OECD Test Guideline 414

Result: negative

Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test

Species: Rabbit

Application Route: inhalation (gas)

Method: OECD Test Guideline 414

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:

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

Difluoromethane:

Exposure routes:

inhalation (gas)

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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:**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.

Difluoromethane:

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:****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

Pentafluoroethane:

Species: Rat
NOAEL: >= 50000 ppm
Application Route: inhalation (gas)
Exposure time: 13 Weeks
Method: OECD Test Guideline 413

Difluoromethane:

Species: Rat, male and female
NOAEL: 49100 ppm
LOAEL: > 49100 ppm
Application Route: inhalation (gas)
Exposure time: 13 Weeks
Method: OECD Test Guideline 413

Aspiration toxicity

Not classified based on available information.

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

No aspiration toxicity classification

Difluoromethane:

No aspiration toxicity classification

11.2 Information on other hazards**Product:**

Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 12: Ecological information**12.1 Toxicity****Components:****1,1,1,2-Tetrafluoroethane:**

Toxicity to fish:

LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l

Exposure time: 96 h

Method: Regulation (EC) No. 440/2008, Annex, C.1

Toxicity to daphnia and other
aquatic invertebrates:

EC50 (Daphnia magna (Water flea)): 980 mg/l

Exposure time: 48 h

Method: Regulation (EC) No. 440/2008, Annex, C.2

Toxicity to algae/aquatic plants:

ErC50 (green algae): > 100 mg/l

Exposure time: 96 h

Remarks: Based on data from similar materials

Pentafluoroethane:

Toxicity to fish:

LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l

Exposure time: 96 h

Remarks: Based on data from similar materials

Toxicity to daphnia and other
aquatic invertebrates:

EC50 (Daphnia magna (Water flea)): > 100 mg/l

Exposure time: 48 h

Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:

ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Remarks: Based on data from similar materials

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Difluoromethane:

Toxicity to fish:

LC50 (Fish): 1,507 mg/l

Exposure time: 96 h

Method: ECOSAR (Ecological Structure Activity Relationships)

Toxicity to daphnia and other
aquatic invertebrates:

EC50 (Daphnia (water flea)): 652 mg/l

Exposure time: 48 h

Method: ECOSAR (Ecological Structure Activity Relationships)

Toxicity to algae/aquatic plants:

EC50 (green algae): 142 mg/l

Exposure time: 96 h

Method: ECOSAR (Ecological Structure Activity Relationships)

12.2 Persistence and degradability**Components:****1,1,1,2-Tetrafluoroethane:**

Biodegradability:

Result: Not readily biodegradable.

Method: OECD Test Guideline 301D

Pentafluoroethane:

Biodegradability:

Result: Not readily biodegradable.

Biodegradation: 5 %

Exposure time: 28 d

Method: OECD Test Guideline 301D

Difluoromethane:

Biodegradability:

Result: Not readily biodegradable.

Method: OECD Test Guideline 301D

12.3 Bioaccumulative potential**Components:****1,1,1,2-Tetrafluoroethane:**

Bioaccumulation:

Remarks: Bioaccumulation is unlikely.

Partition coefficient: noctanol/water:

log Pow: 1.06

Pentafluoroethane:

Partition coefficient: noctanol/water:

Pow: 1.48

Method: OECD Test Guideline 107

Difluoromethane:

Partition coefficient: noctanol/water:

log Pow: 0.714

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 Endocrine disrupting properties

Product:

Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Global warming potential

ODP: 0

GWP: 1,774

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product :

Dispose of in accordance with local regulations. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. 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 handling 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

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	3340	3340	3340
14.2. UN proper shipping name	REFRIGERANT GAS R407C	REFRIGERANT GAS R 407C	Refrigerant gas R 407C
14.3. Transport hazard class(es)	2.2	2.2	2.2
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	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 Maritime transport in bulk according to IMO instruments

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

Safety Data Sheet

According to EU regulation no. 1907/2006 and all latest amendments and additions and EU Regulation 2020/878

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REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast) Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals Not applicable

REACH - List of substances subject to authorisation (Annex XIV) Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. Not applicable

15.2 Chemical safety assessment

Chemical Safety Assessments have been carried out for these substances.

SECTION 16: Other information

Other information

Recommended uses and restrictions

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.
National and local regulations concerning chemicals shall be observed.

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

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

Safety Data Sheet

According to EU regulation no. 1907/2006 and all latest amendments and additions and EU Regulation 2020/878

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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; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; 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:

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.

This information does not guarantee the specific properties of the material.

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