



STATEMENT OF CONFORMITY

PASSENGER BAGGAGE. ICAO AND 49 CFR REGULATION

This Statement of Conformity is issued under the sole responsibility of the manufacturer.

MANUFACTURER	
Name of Company	Address
Delta Development Team INC	1635 S Research Loop #303 Tucson, Arizona 85710 USA
<p>This document provides evidence of the applicable rules or laws addressing the transport of the non-operational device as baggage on passenger aircraft.</p>	
PRODUCT IDENTIFICATION	
Device Name	Device Model
Autonomous Portable Refrigeration Unit (APRU)	6L-2. Refrigerant, R-134a (UN 3159) or R-513a (UN1078) less than 0.055 kg. Class 2.2. Non-flammable (see SDS attached)
Standards	
	<p>COMPLIES WITH;</p> <p>ICAO [International Civil Aviation Organization] Technical Instructions for the Safe Transport of Dangerous Goods By Air 2023-2024 (Doc 9284) Special Provision A26 Refrigerating machines include air conditioning units and machines or other appliances which have been designed for the specific purpose of keeping food or other items at low temperature in an internal compartment. Refrigerating machines and refrigerating machine components are considered not subject to these Instructions if containing less than 12 kg of a gas in Division 2.2</p>
	<p>COMPLIES WITH;</p> <p>49 Code of Federal Regulations [USA] Subtitle B. Chapter 1. Subchapter C. Part 173 173.307 Exceptions for compressed gases (a) The following materials are not subject to the requirements of this subchapter (C Hazmat): (4) Refrigerating machines, including dehumidifiers and air conditioners, and components thereof, such as pre-charged tubing containing: (i) 12 kg (25 pounds) or less of a non-flammable, non-toxic gas;</p>

COMPANY REPRESENTATIVE: William Barg

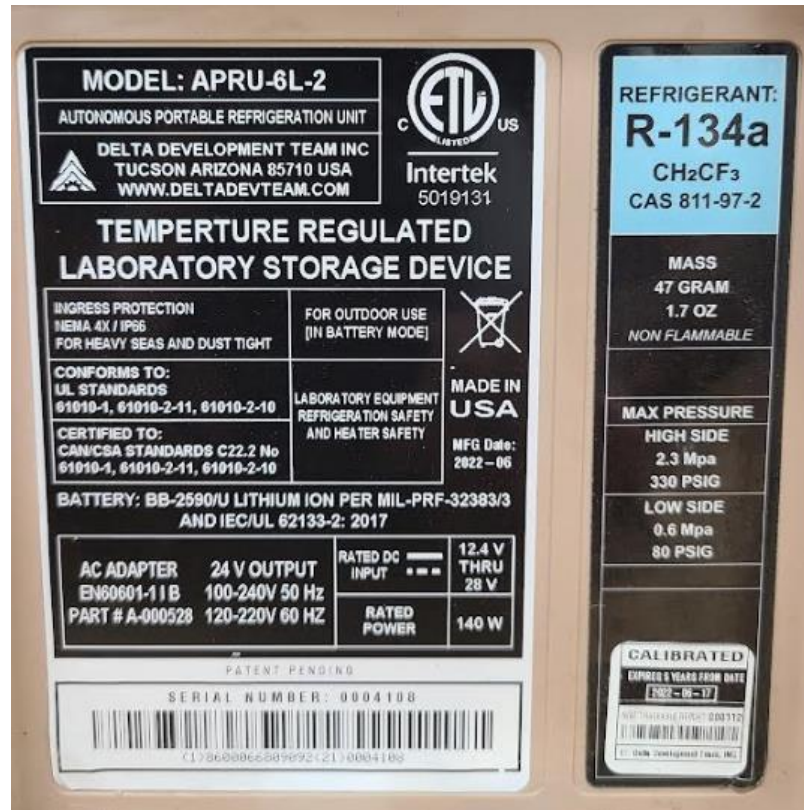
TITLE: Chief Engineer

PLACE: 1635 S Research Loop #303 Tucson AZ USA

SIGNATURE:



DATE: 25 August 2023



APRU 6L-2 Markings Example

Interpretation of Regulations

1. The refrigerants used in the device are non-flammable, class 2.2 (compressed gas)
2. The application is "Refrigerating Machine."
3. The ICAO lists a special provision exempting the device from consideration as dangerous goods containing less than a defined mass of refrigerant.
4. The USA 49 CFR Hazardous Materials regulation lists an exception from consideration as hazardous for a device containing less than a defined mass of refrigerant. (Same as ICAO)

Example

Airline QANTAS giving explicit permission for carriage as baggage.

"Portable Fridge". Allowed as checked baggage.

<https://www.qantas.com/us/en/travel-info/baggage/dangerous-goods/recreational-and-sporting-petrol-powered-equipment.html>



Freon™ 134a Refrigerant - Propellant

Version 8.0 (replaces: Version 7.0)

Revision Date 23.02.2016

Ref. 130000000349

This Safety Data Sheet adheres to the standards and regulatory requirements of Great Britain and may not meet the regulatory requirements in other countries.

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

1.1. Product identifier

Product name : Freon™ 134a Refrigerant - Propellant

Registration number : 01-2119459374-33-0002

Synonyms : 1,1,1,2-Tetrafluoroethane
HFC-134a

Identification number : CAS-No. 811-97-2 EC-No. 212-377-0

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

Use of the Substance/Mixture : Refrigerant, For professional and industrial installation and use only.

1.3. Details of the supplier of the safety data sheet

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

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

Telefax : +31-78-6163737

E-mail address : sds-support@chemours.com

1.4. Emergency telephone number

Emergency telephone number : +(44)-870-8200418 (CHEMTREC - Recommended)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

2.2. Label elements



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Warning

H280	Contains gas under pressure; may explode if heated.
Special labelling of certain substances and mixtures	Contains: 1,1,1,2-Tetrafluoroethane / Kyoto: Contains fluorinated greenhouse gas covered by the Kyoto Protocol.,HFC-134a,
P410 + P403	Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Rapid evaporation of the liquid may cause frostbite.
Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.
May cause cardiac arrhythmia.

SECTION 3: Composition/information on ingredients

3.1. Substances

Registration number	Classification according to Regulation (EU) 1272/2008 (CLP)	Concentration (% w/w)
1,1,1,2-Tetrafluoroethane (CAS-No.811-97-2) (EC-No.212-377-0)		
01-2119459374-33-0002	Press. Gas Liquefied gas; H280	100 %

3.2. Mixtures

Not applicable

The above products are compliant to REACH registration obligations; Registration number(s) may not be provided because substance(s) are exempted, not yet registered under REACH or are registered under another regulatory process (biocide uses, plant protection products), etc.



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For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

- General advice : If unconscious place in recovery position and seek medical advice. Never give anything by mouth to an unconscious person. If breathing is irregular or stopped, administer artificial respiration.
- : First aider needs to protect himself.
- : If symptoms persist, call a physician.
- Inhalation : Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.
- Skin contact : Take off all contaminated clothing immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.
- Eye contact : Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- Ingestion : Is not considered a potential route of exposure.

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

- Symptoms : Inhalation of high concentration may cause central nervous system depression resulting in dizziness, weakness, nausea, headache and possibly unconsciousness., Anaesthetic effects, Light-headedness, Confusion, Incoordination, Drowsiness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness
- : Skin contact may provoke the following symptoms:, Frostbite

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

- Treatment : Do not give adrenaline or similar drugs.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment., Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2. Special hazards arising from the substance or mixture



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Specific hazards during firefighting : Pressure build-up. Fire or intense heat may cause violent rupture of packages.

: Hazardous combustion products:
: Hydrogen fluoride
: Fluorinated compounds
: Carbon oxides
: Exposure to decomposition products may be a hazard to health.

5.3. Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire. Exposure to decomposition products may be a hazard to health.

: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire.

Further information : Cool containers/tanks with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Evacuate personnel to safe areas. Ventilate area, especially low or enclosed places where heavy vapours might collect. Refer to protective measures listed in sections 7 and 8.

6.2. Environmental precautions

Environmental precautions : Should not be released into the environment.

In accordance with local and national regulations.

6.3. Methods and materials for containment and cleaning up

Methods for cleaning up : Evaporates.

6.4. Reference to other sections

For disposal instructions see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling : Vapours are heavier than air and may spread along floors. Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section



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8.

Advice on protection against fire and explosion : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Do not drag, slide or roll cylinders. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Keep at temperature not exceeding 52°C. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from contamination. Protect cylinders from damage. Keep away from direct sunlight. Store only in approved containers.

Advice on common storage : No materials to be especially mentioned. For further information see Section 10 of the safety data sheet.

Storage temperature : < 52 °C

7.3. Specific end use(s)

no data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

If sub-section is empty then no values are applicable.

Components with workplace control parameters

Type Form of exposure	Control parameters	Update	Regulatory basis	Remarks
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1,1,1,2-Tetrafluoroethane (CAS-No. 811-97-2)

Time Weighted Average (TWA):	4,240 mg/m ³ 1,000 ppm	2007	UK. EH40 Workplace Exposure Limits (WELs)	
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Derived No Effect Level (DNEL)

- 1,1,1,2-Tetrafluoroethane : Type of Application (Use): Workers
Exposure routes: Inhalation
Health Effect: Chronic effects, Systemic toxicity
Value: 13936 mg/m³
- : Type of Application (Use): Consumers
Exposure routes: Inhalation



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Health Effect: Chronic effects, Systemic toxicity
Value: 2476 mg/m³

Predicted No Effect Concentration (PNEC)

- 1,1,1,2-Tetrafluoroethane : Value: 0.1 mg/l
Compartment: Fresh water
- : Value: 0.01 mg/l
Compartment: Marine water
- : Value: 1 mg/l
Compartment: Water
Remarks: Intermittent use/release
- : Value: 0.75 mg/kg dry weight (d.w.)
Compartment: Fresh water sediment
- : Value: 73 mg/l
Compartment: Water
Remarks: Sewage treatment plants

8.2. Exposure controls

- Engineering measures : Ensure adequate ventilation, especially in confined areas.
- Eye protection : Wear safety glasses or coverall chemical splash goggles. Eye protection complying with EN 166. or ANSI Z87.1 Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.
- Hand protection : Material: Leather gloves
The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- : Material: Low temperature resistant gloves
- : Protective gloves complying with EN 374. or US OSHA guidelines
- : The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
- Skin and body protection : Wear suitable protective equipment. Wear as appropriate: Impervious clothing



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- Protective measures : When using do not smoke. Self-contained breathing apparatus (SCBA) is required if a large release occurs.
- The type of protective equipment must be selected according to the concentration and amount of the substance at the specific workplace.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
- Respiratory protection : For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Respiratory protection complying with EN 137.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Form : Liquefied gas
- Colour : colourless
- Odour : slight, ether-like
- Freezing point : -108 °C at 1,013 hPa
- Boiling point : -26 °C at 1,013 hPa
- Flammability (solid, gas) : The product is not flammable.
- Auto-ignition temperature : 743 °C at 1,013 hPa
- Oxidizing properties : The product is not oxidizing.
- Vapour pressure : 5,700 hPa at 20 °C
- Relative density : 4.24 at 20 °C
- Water solubility : 1 g/l at 25 °C
- Partition coefficient: n-octanol/water : Pow: 1.06 at 25 °C

9.2. Other information

- Phys.-chem./other information : No other data to be specially mentioned.



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SECTION 10: Stability and reactivity

- 10.1. Reactivity** : Decomposes on heating.
- 10.2. Chemical stability** : The product is chemically stable.
- 10.3. Possibility of hazardous reactions** : Stable under recommended storage conditions.
- 10.4. Conditions to avoid** : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions. Pressurized container: Do not pierce or burn, even after use. Keep at temperature not exceeding 52°C.
- 10.5. Incompatible materials** : Alkali metals
Alkaline earth metals
Powdered metals
Powdered metal salts
- 10.6. Hazardous decomposition products** : Hazardous thermal decomposition products may include:
Hydrogen fluoride
Carbon oxides
Fluorocarbons
Carbonyl fluoride

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute inhalation toxicity

- 1,1,1,2-Tetrafluoroethane
LC50 / 4 h Rat :> 567000 ppm

No Observed Adverse Effect Concentration / Dog :40000 ppm
Cardiac sensitization

Low Observed Adverse Effect Concentration (LOAEC) / Dog :80000 ppm
Cardiac sensitization

Skin irritation

- 1,1,1,2-Tetrafluoroethane
Rabbit
Classification: Not classified as irritant
Result: No skin irritation

Eye irritation



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- 1,1,1,2-Tetrafluoroethane
Rabbit
Classification: Not classified as irritant
Result: No eye irritation

Sensitisation

- 1,1,1,2-Tetrafluoroethane
Guinea pig
Classification: Does not cause skin sensitisation.
Result: Does not cause skin sensitisation.

- Rat
Classification: Does not cause respiratory sensitisation.
Result: Does not cause respiratory sensitisation.

Repeated dose toxicity

- 1,1,1,2-Tetrafluoroethane
Inhalation Rat
No toxicologically significant effects were found.

Mutagenicity assessment

- 1,1,1,2-Tetrafluoroethane
Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity assessment

- 1,1,1,2-Tetrafluoroethane
Not classifiable as a human carcinogen. Overall weight of evidence indicates that the substance is not carcinogenic.

Toxicity to reproduction assessment

- 1,1,1,2-Tetrafluoroethane
No toxicity to reproduction No effects on or via lactation Animal testing showed no reproductive toxicity.

Assessment teratogenicity

- 1,1,1,2-Tetrafluoroethane
Animal testing showed no developmental toxicity.

Further information

Cardiac sensitisation threshold limit : 312975 mg/m³
Avoid skin contact with leaking liquid (danger of frostbite). Inhalation of decomposition products in high concentration may cause shortness of breath (lung oedema).



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SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish

- 1,1,1,2-Tetrafluoroethane
LC50 / 96 h / Oncorhynchus mykiss (rainbow trout): 450 mg/l

Toxicity to aquatic plants

- 1,1,1,2-Tetrafluoroethane
ErC50 / 96 h / Algae: 142 mg/l
Information given is based on data obtained from similar substances.

NOEC / 72 h / Pseudokirchneriella subcapitata (green algae): 13.2 mg/l
Information given is based on data obtained from similar substances.

Toxicity to aquatic invertebrates

- 1,1,1,2-Tetrafluoroethane
EC50 / 48 h / Daphnia magna (Water flea): 980 mg/l

12.2. Persistence and degradability

Biodegradability

- 1,1,1,2-Tetrafluoroethane
Not biodegradable

12.3. Bioaccumulative potential

no data available

12.4. Mobility in soil

Mobility in soil

Koc: 37.26

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). / This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6. Other adverse effects



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Ozone depletion potential

0

Global warming potential (GWP)

1300

Additional ecological information

IPCC - TAR (Third Assessment Report of the Intergovernmental Panel on Climate Change) - 2001

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product : Can be used after re-conditioning.
If re-conditioning is not practicable, dispose of in compliance with local regulations.

Contaminated packaging : Empty pressure vessels should be returned to the supplier.
If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14: Transport information

ADR

14.1. UN number: 3159
14.2. UN proper shipping name: 1,1,1,2-TETRAFLUOROETHANE
14.3. Transport hazard class(es): 2
14.4. Packing group: Not applicable
14.5. Environmental hazards: For further information see Section 12.
14.6. Special precautions for user:
Tunnel restriction code: (C/E)

IATA_C

14.1. UN number: 3159
14.2. UN proper shipping name: 1,1,1,2-Tetrafluoroethane
14.3. Transport hazard class(es): 2.2
14.4. Packing group: Not applicable
14.5. Environmental hazards : For further information see Section 12.
14.6. Special precautions for user:
no data available

IMDG

14.1. UN number: 3159
14.2. UN proper shipping name: 1,1,1,2-TETRAFLUOROETHANE
14.3. Transport hazard class(es): 2.2
14.4. Packing group: Not applicable
14.5. Environmental hazards : For further information see Section 12.
14.6. Special precautions for user:



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no data available

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

Other regulations : Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.
An Exposure Scenario (ES) is not required.

SECTION 16: Other information

Full text of H-Statements referred to under section 3.

H280 Contains gas under pressure; may explode if heated.

Abbreviations and acronyms

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute toxicity estimate
CAS-No.	Chemical Abstracts Service number
CLP	Classification, Labelling and Packaging
EbC50	Concentration at which 50% reduction of biomass is observed
EC50	Median effective concentration
EN	European Norm
EPA	Environmental Protection Agency
ErC50	Concentration at which a 50% inhibition of growth rate is observed
EyC50	Concentration at which 50 % inhibition of yield is observed
IATA_C	International Air Transport Association (Cargo)
IBC	International Bulk Chemical Code
ICAO	International Civil Aviation Organization
ISO	International Standard Organization
IMDG	International Maritime Dangerous Goods
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LOEC	Lowest Observed Effect Concentration
LOEL	Lowest observed effect level
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
n.o.s.	Not Otherwise Specified
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No observed adverse effect level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level



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OECD	Organisation for Economic Co-operation and Development
OPPTS	Office of Prevention, Pesticides and Toxic Substances
PBT	Persistent, Bioaccumulative and Toxic
STEL	Short term exposure limit
TWA	Time Weighted Average (TWA):
vPvB	very Persistent and very Bioaccumulative

Further information

Freon™ 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.

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

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.

**Opteon™ XP10 (R-513A) Refrigerant**

Version 2.1

Revision Date 08/31/2015

Ref. 130000051352

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Opteon™ XP10 (R-513A) Refrigerant
Tradename/Synonym	:	Opteon™ 513A R-513A XP10
Product Grade/Type	:	ASHRAE Refrigerant Number Designation: R-513A
Product Use	:	Refrigerant, For professional users only.
Restrictions on use	:	Consumer use
Manufacturer/Supplier	:	The Chemours Company FC, LLC 1007 Market Street Wilmington, DE 19899 United States of America
Product Information	:	1-844-773-CHEM (outside the U.S. 1-302-773-1000)
Medical Emergency	:	1-866-595-1473 (outside the U.S. 1-302-773-2000)
Transport Emergency	:	CHEMTREC: +1-800-424-9300 (outside the U.S. +1-703-527-3887)
Other information	:	For Research and Development purposes only. Must be handled only under the direct supervision of a technically qualified individual.

SECTION 2. HAZARDS IDENTIFICATION

Product hazard category
Gases under pressure Liquefied gas

**Opteon™ XP10 (R-513A) Refrigerant**

Version 2.1

Revision Date 08/31/2015

Ref. 130000051352

Label content

Pictogram :



Signal word : Warning

Hazardous warnings : Contains gas under pressure; may explode if heated.

Hazardous prevention measures : Protect from sunlight. Store in a well-ventilated place.

Other hazards

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing., Rapid evaporation of the liquid may cause frostbite., Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects., May cause cardiac arrhythmia.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
2,3,3,3-Tetrafluoropropene (HFO-1234yf)	754-12-1	56 %
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	44 %



Opteon™ XP10 (R-513A) Refrigerant

Version 2.1

Revision Date 08/31/2015

Ref. 130000051352

SECTION 4. FIRST AID MEASURES

- General advice : Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.
- Inhalation : Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.
- Skin contact : Take off contaminated clothing and shoes immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.
- Eye contact : Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- Ingestion : Is not considered a potential route of exposure.
- Most important symptoms/effects, acute and delayed : Anaesthetic effects Light-headedness irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness Narcotic effects
- Protection of first-aiders : If potential for exposure exists refer to Section 8 for specific personal protective equipment.
- 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 special caution.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment., Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.



Opteon™ XP10 (R-513A) Refrigerant

Version 2.1

Revision Date 08/31/2015

Ref. 130000051352

- Unsuitable extinguishing media : No applicable data available.
- Specific hazards : The product is not flammable.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire.
- Further information : Cool containers/tanks with water spray.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Safeguards (Personnel) : Evacuate personnel to safe areas. Ventilate area, especially low or enclosed places where heavy vapours might collect. Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : Should not be released into the environment.
- Spill Cleanup : Evaporates.
- Accidental Release Measures : Avoid open flames and high temperatures. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

SECTION 7. HANDLING AND STORAGE

- Handling (Personnel) : Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8. Handle in accordance with good industrial hygiene and safety practice.

**Opteon™ XP10 (R-513A) Refrigerant**

Version 2.1

Revision Date 08/31/2015

Ref. 130000051352

- Handling (Physical Aspects) : The product should not be mixed with air for leak testing or used with air for any other purpose above atmospheric pressure. Contact with chlorine or other strong oxidizing agents should also be avoided.
- Dust explosion class : Not applicable
- Storage : Do not drag, slide or roll cylinders. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Keep at temperature not exceeding 52°C. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from contamination. Protect cylinders from damage. Keep away from direct sunlight. Store only in approved containers.
No materials to be especially mentioned.
The product has an indefinite shelf life when stored properly.
- Storage period : > 10 yr
- Storage temperature : < 52 °C (< 126 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Engineering controls : Ensure adequate ventilation, especially in confined areas.
- Personal protective equipment
- Respiratory protection : For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Hand protection : Additional protection: Impervious gloves
- Eye protection : Wear safety glasses or coverall chemical splash goggles. Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.
- Skin and body protection : Where there is potential for skin contact have available and wear as appropriate impervious gloves, apron, pants, and jacket.

Exposure Guidelines

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Exposure Limit Values

This product does not contain any exposure limits that require disclosure according to OSHA Hazard Communication Standard 2012.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state : gaseous
Form : Liquefied gas
Color : clear

Odor : slight, ether-like

Odor threshold : No applicable data available.

pH : neutral

Melting point/range : No applicable data available.

Boiling point/boiling range : Boiling point
-29.2 °C (-20.6 °F)

Flash point : does not flash

Evaporation rate : > 1
(CCL4=1.0)

Flammability (solid, gas) : The product is not flammable.

Upper explosion limit : Method: None per ASTM E681

Lower explosion limit : Method: None per ASTM E681

Vapor pressure : 7,063.6 hPa at 25 °C (77 °F)

Vapor density : 3.83 at 25 °C (77 °F)

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	(Air = 1.0)
Specific gravity (Relative density)	: 1.17 at 25 °C (77 °F)
Water solubility	: No applicable data available.
Solubility(ies)	: No applicable data available.
Partition coefficient: n-octanol/water	: No applicable data available.
Auto-ignition temperature	: No applicable data available.
Decomposition temperature	: No applicable data available.
Viscosity, kinematic	: No applicable data available.
Viscosity, dynamic	: No applicable data available.
% Volatile	: 100 %

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Decomposes on heating.
Chemical stability	: The product is chemically stable under recommended conditions of storage, use and temperature.
Possibility of hazardous reactions	: Polymerization will not occur.
Conditions to avoid	: Avoid open flames and high temperatures.
Incompatible materials	: Strong bases Alkaline earth metals finely divided metal powders such as, Aluminium, Magnesium, Zinc strong oxidizers
Hazardous decomposition	: Hazardous decomposition products may include:, Hydrogen fluoride, Carbon



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products

oxides, Fluorinated hydrocarbons, Carbonyl fluoride

SECTION 11. TOXICOLOGICAL INFORMATION

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Further information : Avoid skin contact with leaking liquid (danger of frostbite). May cause cardiac arrhythmia.

2,3,3,3-Tetrafluoropropene (HFO-1234yf)

Inhalation 4 h LC50 : > 405000 ppm , Rat

Inhalation Low Observed Adverse Effect : > 120000 ppm , Dog
Cardiac sensitization

Concentration (LOAEC) Inhalation No Observed Adverse Effect : 120000 ppm , Dog
Cardiac sensitization

Concentration Skin irritation : No skin irritation, Not tested on animals
Not expected to cause skin irritation based on expert review of the properties of the substance.

Eye irritation : No eye irritation, Not tested on animals
Not expected to cause eye irritation based on expert review of the properties of the substance.

Skin sensitization : Not tested on animals
Not expected to cause sensitization based on expert review of the properties of the substance.

There are no reports of human respiratory sensitization.

Repeated dose toxicity : Inhalation
Rat
-
gas
NOAEL: 233 mg/l, 50,000 ppm,
No toxicologically significant effects were found.

Inhalation
Rabbit



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-
gas
NOAEL: 2.33 mg/l, 500 ppm,
No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification.

Inhalation
Mini-pig
-
gas
NOAEL: 50 mg/l, 10,000 ppm,
No toxicologically significant effects were found.

- Carcinogenicity : Not classifiable as a human carcinogen.
Sufficient data are available to conclude that the substance is not expected to be carcinogenic.
- Mutagenicity : Animal testing did not show any mutagenic effects.
Did not cause genetic damage in cultured mammalian cells.
Experiments showed mutagenic effects in cultured bacterial cells.
- Reproductive toxicity : No toxicity to reproduction
Animal testing showed no reproductive toxicity.
- Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

- 1,1,1,2-Tetrafluoroethane (HFC-134a)
Inhalation 4 h LC50 : > 567000 ppm , Rat
- Inhalation No Observed
Adverse Effect : 40000 ppm , Dog
Concentration Cardiac sensitization
- Inhalation Low Observed
Adverse Effect : 80000 ppm , Dog
Concentration (LOAEC) Cardiac sensitization
- Skin irritation : No skin irritation, Rabbit
- Eye irritation : No eye irritation, Rabbit



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- Skin sensitization : Does not cause skin sensitisation., Guinea pig
Does not cause respiratory sensitisation., Rat
- Repeated dose toxicity : Inhalation
Rat
-
gas
NOAEL: 50000,
No toxicologically significant effects were found.
- Carcinogenicity : Not classifiable as a human carcinogen.
Overall weight of evidence indicates that the substance is not carcinogenic.
- Mutagenicity : Animal testing did not show any mutagenic effects.
Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
- Reproductive toxicity : No toxicity to reproduction
No effects on or via lactation
Animal testing showed no reproductive toxicity.
- Teratogenicity : Animal testing showed no developmental toxicity.

Carcinogenicity

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

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

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SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity

2,3,3,3-Tetrafluoropropene (HFO-1234yf)

96 h LC50 : Cyprinus carpio (Carp) > 197 mg/l

72 h NOEC : Algae > 100 mg/l

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

1,1,1,2-Tetrafluoroethane (HFC-134a)

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

96 h ErC50 : Algae 142 mg/l
Information given is based on data obtained from similar substances.72 h NOEC : Pseudokirchneriella subcapitata (green algae) 13.2 mg/l
Information given is based on data obtained from similar substances.

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

SECTION 13. DISPOSAL CONSIDERATIONS

Waste disposal methods - Product : Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulations.

Can be used after re-conditioning. In accordance with local and national regulations.

Contaminated packaging : Empty pressure vessels should be returned to the supplier.

SECTION 14. TRANSPORT INFORMATION



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DOT	UN number	: 1078
	Proper shipping name	: Refrigerant gases, n.o.s. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane)
	Class	: 2.2
	Labelling No.	: 2.2
IATA_C	UN number	: 1078
	Proper shipping name	: Refrigerant gas, n.o.s. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane)
	Class	: 2.2
	Labelling No.	: 2.2
IMDG	UN number	: 1078
	Proper shipping name	: REFRIGERANT GAS, N.O.S. (2,3,3,3-Tetrafluoropropene, 1,1,1,2-Tetrafluoroethane)
	Class	: 2.2
	Labelling No.	: 2.2

SECTION 15. REGULATORY INFORMATION

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

: 2,3,3,3-Tetrafluoropropene
PMN Number: P-07-0601 (Honeywell)

TSCA 12B This material contains one or more substances which requires export notification under TSCA Section 12(b) and 40 CFR Part 707 Subpart D:

2,3,3,3-Tetrafluoropropene
PMN Number: P-07-0601 (Honeywell)

Processors and users of this substance must also comply with the applicable



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general SNUR requirements set forth in 40 CFR 721 subpart A, including export notification requirements if applicable (40 CFR 721.20), and the applicable record keeping requirements set forth at 40 CFR 721.125.

SARA 313 Regulated Chemical(s) : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65 : Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known

SECTION 16. OTHER INFORMATION

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