Safety Data Sheet

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

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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 %

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.

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.

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

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)

(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

products oxides, Fluorinated hydrocarbons, Carbonyl fluoride

SECTION 11. TOXICOLOGICAL INFORMATION

Opteon™ XP10 (R-513A) Refrigerant

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 Concentration (LOAEC) : > 120000 ppm , Dog
Cardiac sensitization

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

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

-
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 Concentration	:	40000 ppm , Dog Cardiac sensitization
Inhalation Low Observed Adverse Effect Concentration (LOAEC)	:	80000 ppm , Dog Cardiac sensitization
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	No eye irritation, Rabbit

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.

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

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

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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Chemours™ and the Chemours Logo are trademarks of The Chemours Company.
Before use read Chemours safety information.
For further information contact the local Chemours office or nominated distributors.

Revision Date : 08/31/2015

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