

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

SECTION 1. IDENTIFICATION

Product name : Opteon™ XP40 (R-449A) Refrigerant

SDS-Identcode : 130000133420

Manufacturer or supplier's details

Company name of supplier : The Chemours Company FC, LLC

Address : 1007 Market Street
Wilmington, DE 19899 United States of America (USA)

Telephone : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)

Emergency telephone : Medical emergency: 1-866-595-1473 (outside the U.S. 1-302-773-2000) ; Transport emergency: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

Recommended use of the chemical and restrictions on use

Recommended use : Refrigerant

Restrictions on use : Consumer use, For professional users only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Gases under pressure : Liquefied gas

Simple Asphyxiant

GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H280 Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary Statements : **Storage:**
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Other hazards

|| Vapors 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

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

cardiac effects.
Rapid evaporation of the product may cause frostbite.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture
Chemical nature : Fluorinated hydrocarbons

Hazardous ingredients

Chemical name	CAS-No.	Concentration (% w/w)
1,1,1,2-Tetrafluoroethane*	811-97-2	25.7
2,3,3,3-Tetrafluoropropene*	754-12-1	25.3
Pentafluoroethane*	354-33-6	24.7
Difluoromethane*	75-10-5	24.3

* Voluntarily-disclosed non-hazardous substance

SECTION 4. 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.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

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.

Most important symptoms and effects, both acute and delayed : May cause cardiac arrhythmia.
Contact with liquid or refrigerated gas can cause cold burns and frostbite.
Other symptoms potentially related to misuse or inhalation abuse are
Cardiac sensitization
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

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

Eye contact may provoke the following symptoms
tearing
Redness
Discomfort

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

Notes to physician : Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Not applicable
Will not burn

Unsuitable extinguishing media : Not applicable
Will not burn

Specific hazards during fire fighting : 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
carbonyl fluoride
Carbon oxides
Fluorine compounds

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.

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

SECTION 6. ACCIDENTAL RELEASE MEASURES

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

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

Methods and materials 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.

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

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

SECTION 7. HANDLING AND STORAGE

- 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.
- Conditions for safe storage : 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 labeled containers.
Keep in a cool, well-ventilated place.
Keep away from direct sunlight.
Store in accordance with the particular national regulations.
- Materials to avoid : 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

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

Substances and mixtures which in contact with water emit flammable gases
Explosives
Acutely toxic substances and mixtures
Substances and mixtures with chronic toxicity

Recommended storage temperature : < 126 °F / < 52 °C
Storage period : > 10 y
Further information on storage stability : The product has an indefinite shelf life when stored properly.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
1,1,1,2-Tetrafluoroethane	811-97-2	TWA	1,000 ppm	US WEEL
2,3,3,3-Tetrafluoropropene	754-12-1	TWA	500 ppm	US WEEL
Pentafluoroethane	354-33-6	TWA	1,000 ppm	US WEEL
Difluoromethane	75-10-5	TWA	1,000 ppm	US WEEL

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

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection
Material : Low temperature resistant gloves

Remarks : Choose gloves to protect hands against chemicals depending on the concentration 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

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

- end of workday. Breakthrough time is not determined for the product. Change gloves often!
- Eye protection : Wear the following personal protective equipment:
Chemical resistant goggles must be worn.
Face-shield
- Skin and body protection : Skin should be washed after contact.
- Protective measures : Wear cold insulating gloves/ face shield/ eye protection.
- Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
-

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Liquefied gas
- Color : clear
- Odor : slight, ether-like
- Odor Threshold : No data available
- pH : No data available
- Melting point/freezing point : No data available
- Initial boiling point and boiling range : -51 °F / -46 °C
- Flash point : Not applicable
- Evaporation rate : > 1
(CCL4=1.0)
- 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
Method: ASTM E681
None.
- Vapor pressure : 12,748 hPa (77 °F / 25 °C)
- Relative vapor density : 3.07
(Air = 1.0)
- Relative density : 1.10 (77 °F / 25 °C)
-

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

Solubility(ies)	
Water solubility	: No data available
Partition coefficient: n-octanol/water	: Not applicable
Autoignition 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.
Particle size	: Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.
Possibility of hazardous reactions	: Can react with strong oxidizing agents.
Conditions to avoid	: Heat, flames and sparks.
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
Skin contact
Eye contact

Acute toxicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Acute inhalation toxicity	: LC50 (Rat): > 567000 ppm Exposure time: 4 h Test atmosphere: gas
---------------------------	--

Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

No observed adverse effect concentration (Dog): 40000 ppm
Test atmosphere: gas
Symptoms: Cardiac sensitization

Lowest observed adverse effect concentration (Dog): 80000 ppm
Test atmosphere: gas
Symptoms: Cardiac sensitization

Cardiac sensitisation threshold limit (Dog): 334,000 mg/m³
Test atmosphere: gas
Symptoms: Cardiac sensitization

2,3,3,3-Tetrafluoropropene:

Acute inhalation toxicity : LC50 (Rat): > 405000 ppm
Exposure time: 4 h
Test atmosphere: gas

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

No observed adverse effect concentration (Dog): 120000 ppm
Test atmosphere: gas
Symptoms: Cardiac sensitization

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

Pentafluoroethane:

Acute inhalation toxicity : LC0 (Rat): > 800000 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: OECD Test Guideline 403

Difluoromethane:

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

Lowest observed adverse effect concentration (Dog): > 350000 ppm
Symptoms: Cardiac sensitization

No observed adverse effect concentration (Dog): 350000 ppm
Symptoms: Cardiac sensitization

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

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

Skin corrosion/irritation

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Species : Rabbit
Result : No skin irritation

2,3,3,3-Tetrafluoropropene:

Species : Not tested on animals
Result : No skin irritation

Difluoromethane:

Species : Not tested on animals
Result : No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Species : Rabbit
Result : No eye irritation

2,3,3,3-Tetrafluoropropene:

Species : Not tested on animals
Result : No eye irritation

Difluoromethane:

Species : Not tested on animals
Result : No eye irritation

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

Routes of exposure : Skin contact
Species : Guinea pig
Result : negative

Species : Rat
Result : negative

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

2,3,3,3-Tetrafluoropropene:

Routes of exposure : Skin contact
Species : Not tested on animals
Result : negative

Difluoromethane:

Routes of exposure : Skin contact
Species : Not tested on animals
Result : negative

Species : Not tested on animals
Result : negative

Germ cell mutagenicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

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

2,3,3,3-Tetrafluoropropene:

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

Pentafluoroethane:

Genotoxicity in vitro : 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

Difluoromethane:

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:

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

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

2,3,3,3-Tetrafluoropropene:

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

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

Components:

1,1,1,2-Tetrafluoroethane:

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

2,3,3,3-Tetrafluoropropene:

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 (vapor)
Result: negative
Remarks: Based on data from similar materials

Effects on fetal development : Test Type: Embryo-fetal development
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 414
Result: negative

Difluoromethane:

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity, Based on data from similar materials

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Not classified based on available information.

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

Components:

1,1,1,2-Tetrafluoroethane:

Assessment : No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

2,3,3,3-Tetrafluoropropene:

Assessment : No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

Difluoromethane:

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
NOAEL : 50000 ppm
LOAEL : > 50000 ppm
Application Route : inhalation (gas)
Exposure time : 90 d
Method : OECD Test Guideline 413
Remarks : No significant adverse effects were reported

2,3,3,3-Tetrafluoropropene:

Species : Rat
NOAEL : 50000 ppm
LOAEL : >50000 ppm
Application Route : inhalation (gas)
Exposure time : 90 d
Method : OECD Test Guideline 413
Remarks : No significant adverse effects were reported

Pentafluoroethane:

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

Difluoromethane:

Species : Rat
NOAEL : 49100 ppm
Application Route : inhalation (gas)
Exposure time : 90 d
Remarks : No significant adverse effects were reported

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

1,1,1,2-Tetrafluoroethane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 980 mg/l
Exposure time: 48 h

Toxicity to algae : ErC50 (algae): 142 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (green algae)): 13.2 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

2,3,3,3-Tetrafluoropropene:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): > 197 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h

Toxicity to algae : NOEC (algae): > 100 mg/l
Exposure time: 72 h

Pentafluoroethane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l
Exposure time: 96 h
Method: Directive 67/548/EEC, Annex V, C.1.
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 980 mg/l
Exposure time: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.
Remarks: Based on data from similar materials

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (green algae)): > 114 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (green algae)): 13.2

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Difluoromethane:

Toxicity to fish : LC50 (Fish): 1,507 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia): 652 mg/l
Exposure time: 48 h

Toxicity to algae : EC50 (algae): 142 mg/l
Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEC (Fish): 65.8 mg/l
Exposure time: 30 d

Persistence and degradability

Components:

1,1,1,2-Tetrafluoroethane:

Biodegradability : Result: Not readily biodegradable.

2,3,3,3-Tetrafluoropropene:

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

Pentafluoroethane:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Difluoromethane:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Bioaccumulative potential

Components:

1,1,1,2-Tetrafluoroethane:

Partition coefficient: n-octanol/water : log Pow: 1.06

2,3,3,3-Tetrafluoropropene:

Bioaccumulation : Remarks: No bioaccumulation is to be expected (log Pow <=

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

||

4).

Pentafluoroethane:

|| Partition coefficient: n-octanol/water : Pow: 1.48 (77 °F / 25 °C)

Difluoromethane:

|| Partition coefficient: n-octanol/water : log Pow: 0.714

Mobility in soil

No data available

Other adverse effects

Product:

|| Results of PBT and vPvB assessment : This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of in accordance with local regulations.

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

International Regulations

UNRTDG

UN number : UN 1078
Proper shipping name : REFRIGERANT GAS, N.O.S.
(1,1,1,2-Tetrafluoroethane, 2,3,3,3-Tetrafluoropropene)
Class : 2.2
Packing group : Not assigned by regulation
Labels : 2.2

IATA-DGR

UN/ID No. : UN 1078
Proper shipping name : Refrigerant gas, n.o.s.
(1,1,1,2-Tetrafluoroethane, 2,3,3,3-Tetrafluoropropene)
Class : 2.2
Packing group : Not assigned by regulation
Labels : Non-flammable, non-toxic Gas
Packing instruction (cargo) : 200

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

aircraft)

Packing instruction (passenger aircraft) : 200

IMDG-Code

UN number : UN 1078
Proper shipping name : REFRIGERANT GAS, N.O.S.
(1,1,1,2-Tetrafluoroethane, 2,3,3,3-Tetrafluoropropene)
Class : 2.2
Packing group : Not assigned by regulation
Labels : 2.2
EmS Code : F-C, S-V
Marine pollutant : no

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

Not applicable for product as supplied.

Domestic regulation

49 CFR

UN/ID/NA number : UN 1078
Proper shipping name : Refrigerant gases, n.o.s.
(1,1,1,2-Tetrafluoroethane, 2,3,3,3-Tetrafluoropropene)
Class : 2.2
Packing group : Not assigned by regulation
Labels : NON-FLAMMABLE GAS
ERG Code : 126
Marine pollutant : no

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.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Gases under pressure
Simple Asphyxiant

SARA 313 : 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.

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

US State Regulations

Pennsylvania Right To Know

1,1,1,2-Tetrafluoroethane	811-97-2
2,3,3,3-Tetrafluoropropene	754-12-1
Pentafluoroethane	354-33-6
Difluoromethane	75-10-5

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

California List of Hazardous Substances

Difluoromethane	75-10-5
-----------------	---------

Additional regulatory information

2,3,3,3-Tetrafluoropropene	754-12-1
----------------------------	----------

The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.

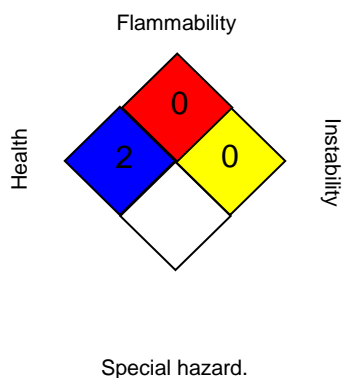
See 40 CFR § 721.10182

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

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

HEALTH	/	0
FLAMMABILITY		0
PHYSICAL HAZARD		3

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Opteon™ 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.

All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

Full text of other abbreviations

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version 8.0 Revision Date: 06/08/2018 SDS Number: 1349484-00040 Date of last issue: 10/25/2017
Date of first issue: 02/27/2017

US WEEL : USA. Workplace Environmental Exposure Levels (WEEL)
US WEEL / TWA : 8-hr TWA

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance 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

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

Revision Date : 06/08/2018

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

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.

SAFETY DATA SHEET



Opteon™ XP40 (R-449A) Refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 10/25/2017
8.0	06/08/2018	1349484-00040	Date of first issue: 02/27/2017

US / Z8