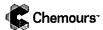
Freon™ 410A (R-410A) Refrigerant



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SECTION 1. IDENTIFICATION

Product name

: Freon™ 410A (R-410A) Refrigerant

Other means of identification

No data available

SDS-Identcode

130000050990

Manufacturer or supplier's details

Company name of supplier

: The Chemours Canada Company

Address

PO Box 118 Streetsville

Streetsville ON L5M 2B7 Canada

Telephone

1-844-773-CHEM (2436)

Emergency telephone

1-866-595-1473 (24 hours)

Recommended use of the chemical and restrictions on use

Recommended use

Refrigerant

Restrictions on use

For professional users only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

Gases under pressure

Liquefied gas

Simple Asphyxiant

Category 1

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

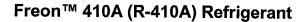
Storage:

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





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cardiac effects.

Rapid evaporation of the product may cause frostbite.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture

: Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Pentafluoroethane*	354-33-6	50
Difluoromethane*	75-10-5	50

^{*} 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

Get medical attention immediately.

In case of eye contact

Get medical attention immediately.

If swallowed

Ingestion is not considered a potential route of exposure.

Other symptoms potentially related to misuse or inhalation

Most important symptoms and effects, both acute and

abuse are

delayed

Cardiac sensitization Anaesthetic effects

Light-headedness

Dizziness confusion

Lack of coordination

Drowsiness Unconsciousness

Contact with liquid or refrigerated gas can cause cold burns

and frostbite.

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

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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 prod- :

ucts

Fluorine compounds

Carbon oxides Hydrogen fluoride carbonyl fluoride

Specific extinguishing meth-

ods

Use extinguishing measures that are appropriate to local cir-

cumstances 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, protec- : tive equipment and emer-

gency 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.

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

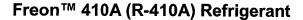
when empty.

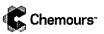
Local/Total ventilation

Use only with adequate ventilation.

Advice on safe handling

Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure





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assessment

Wear cold insulating gloves/ face shield/ eye protection.

Prevent backflow into the gas tank.

Open the valves slowly to prevent pressure surges.

Close valve after each use and when empty. Do NOT change

or force fit connections.

Prevent the intrusion of water into the gas tank. 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.

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.

Use a pressure reducing regulator when connecting cylinder

to lower pressure (<3000 psig) piping or systems.

Never attempt to lift cylinder by its cap. Do not drag, slide or roll cylinders.

Use a suitable hand truck for cylinder movement.

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

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 tem-

perature

< 52 °C

Storage period .

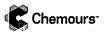
: > 10 y

Further information on stor-

age stability

: The product has an indefinite shelf life when stored properly.





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SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures

: Ensure adequate ventilation, especially in confined areas.

Minimize workplace exposure concentrations.

Personal protective equipment

Respiratory protection

Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates

that exposures are within recommended exposure guidelines.

Filter type

Organic gas and low boiling vapor type

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 end of workday. Breakthrough time is not determined for the

product. Change gloves often!

Eye protection : Wea

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

colorless

Odor

slight, ether-like

Odor Threshold

No data available

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pН

No data available

Melting point/freezing point

No data available

Initial boiling point and boiling

-51.6 °C

range

(1,013 hPa)

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

16,530 hPa (25 °C)

30,520 hPa (50 °C)

Relative vapor density

2.5

Relative density

1.06 (25 °C)

Density

1.062 g/cm3 (25 °C)

(as liquid)

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

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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 reac- : 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:

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

Skin corrosion/irritation

Not classified based on available information.

Components:

Difluoromethane:



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Species

Not tested on animals

Result

No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Components:

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:

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:

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 -

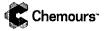
Weight of evidence does not support classification as a germ

Assessment

cell mutagen.

Carcinogenicity

Not classified based on available information.



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Reproductive toxicity

Not classified based on available information.

Components:

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 - As-

sessment

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.

Components:

Difluoromethane:

Assessment

No significant health effects observed in animals at concentra-

tions of 250 ppmV/6h/d or less.

Repeated dose toxicity

Components:

Pentafluoroethane:

Species

Rat

NOAEL

>= 50000 ppm

Application Route

inhalation (gas)

Exposure time

13 Weeks

Method

OECD Test Guideline 413

Difluoromethane:

Species

Rat

NOAEL

49100 ppm

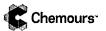
Application Route Exposure time

inhalation (gas)

Remarks

No significant adverse effects were reported





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Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

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

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 tox-

icity)

NOEC (Fish): 65.8 mg/l

Exposure time: 30 d

Persistence and degradability

Components:

Pentafluoroethane:

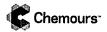
Biodegradability

Result: Not readily biodegradable.

Biodegradation: 5 % Exposure time: 28 d

Method: OECD Test Guideline 301D





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Difluoromethane:

Biodegradability

Result: Not readily biodegradable.

Biodegradation: 5 % Exposure time: 28 d

Method: OECD Test Guideline 301D

Bioaccumulative potential

Components:

Pentafluoroethane:

Partition coefficient: n-

octanol/water

: Pow: 1.48 (25 °C)

Difluoromethane:

Partition coefficient: n-

octanol/water

log Pow: 0.714

Mobility in soil

No data available

Other adverse effects

No data available

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 3163

Proper shipping name

LIQUEFIED GAS, N.O.S.

(Pentafluoroethane, Difluoromethane)

Class

: 2.2

Packing group

: Not assigned by regulation

Labels

: 2.2

IATA-DGR

UN/ID No.

UN 3163

Proper shipping name

Liquefied gas, n.o.s.

(Pentafluoroethane, Difluoromethane)



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Class

2.2

Packing group Labels

Not assigned by regulation Non-flammable, non-toxic Gas

Packing instruction (cargo

200

aircraft)

Packing instruction (passen-

ger aircraft)

200

IMDG-Code

UN number

UN 3163

Proper shipping name

LIQUEFIED GAS, N.O.S.

(Pentafluoroethane, Difluoromethane)

Class

Packing group

Not assigned by regulation

Labels **EmS Code** 2.2 no

Marine pollutant

F-C, S-V

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

Not applicable for product as supplied.

Domestic regulation

TDG

UN number

UN 3163

Proper shipping name

LIQUEFIED GAS, N.O.S.

(Pentafluoroethane, Difluoromethane)

Class

Packing group

Not assigned by regulation

Labels **ERG Code** Marine pollutant 2.2 126 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

SECTION 16. OTHER INFORMATION

Freon™ and any associated logos are trademarks or copyrights of The Chemours Company FC,

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.

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR -Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN -

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Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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; Nch - Chilean Norm; NO(A)EC -No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; 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: WHMIS -Workplace Hazardous Materials Information System

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 Agen-

cy, http://echa.europa.eu/

Revision Date

: 09/19/2018

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.

CA / Z8