

To Our Customers:

The attached Safety Data Sheet (SDS) was prepared by the vendor of the product you purchased through one of our divisions. We used the manufacturer's electronic document directly or scanned a paper copy and generated a file for our automated SDS delivery system.

All statements, technical information, and recommendations contained therein are solely that of the manufacturer of the product. We at Zep Inc. did not verify the accuracy and completeness of the statements and do not warrantee or guarantee the information. We provide vendor SDSs to assist our customers in their compliance efforts. The attached document is in compliance with one of the respective country regulatory requirements noted below:

The OSHA Hazard Communication Standard (in the United States) The Hazardous Products Regulations (in Canada)

We made every effort to deliver all of the information prepared by the manufacturer. We cannot anticipate all conditions under which this information will be used. If you have any questions about the statements on the SDS, please contact the company shown on the document.

Zep Inc. assumes no liability or responsibility for loss or damage resulting from the improper use or handling of this product, from incompatible product combinations, or from the failure to follow instructions, warnings, and advisories in the manufacturer's product label and Safety Data Sheet.

Sincerely,

Product Stewardship Team Zep Inc.



Freon™ 134a Auto (HFC-134a) Refrigerant

Version Revision Date: SDS Number: Date of last issue: 04/27/2017 5.0 05/19/2017 1329655-00032 Date of first issue: 02/27/2017

SECTION 1. IDENTIFICATION

Product name : Freon™ 134a Auto (HFC-134a) Refrigerant

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 : For professional and industrial installation and use only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Gases under pressure : Liquefied gas

GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H280 Contains gas under pressure; may explode if heated.

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 cardiac effects.

Rapid evaporation of the product may cause frostbite.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS



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Substance / Mixture : Substance

Substance name : 1,1,1,2-Tetrafluoroethane

CAS-No. : 811-97-2

Hazardous ingredients

Chemical name	CAS-No.	Concentration (% w/w)
1,1,1,2-Tetrafluoroethane	811-97-2	100

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

Contact with liquid or refrigerated gas can cause cold burns

and frostbite.

May cause cardiac arrhythmia.

Other symptoms potentially related to misuse or inhalation

abuse are

Cardiac sensitization Anaesthetic effects Light-headedness

Dizziness confusion

Lack of coordination

Drowsiness Unconsciousness

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 : Water spray

Alcohol-resistant foam Carbon dioxide (CO2)

Dry chemical



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Unsuitable extinguishing

media

None known.

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

Hydrogen fluoride carbonyl fluoride

Carbon oxides

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

Evacuate area.

Special protective equipment

for fire-fighters

Wear self-contained breathing apparatus for firefighting if nec-

Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec- : tive equipment and emer-

gency procedures

Avoid skin contact with leaking liquid (danger of frostbite). 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 Avoid breathing gas.

Handle in accordance with good industrial hygiene and safety

Wear cold insulating gloves/ face shield/ eye protection.



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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

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

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

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters



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Ingredients	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

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 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 : colorless



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Odor : slight, ether-like

Odor Threshold : No data available

pH : No data available

Melting point/freezing point : -108 °C

Initial boiling point and boiling

range

-26 °C

(1,013 hPa)

Flash point : Not applicable

Evaporation rate : >

(CCL4=1.0)

Flammability (solid, gas) : Will not burn

Self-ignition : The substance or mixture is not classified as pyrophoric.

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 : 5,700 hPa (20 °C)

Relative vapor density : 3.6

Relative density : 1.208 (25 °C)

Density : 1.21 g/cm³ (25 °C)

(as liquid)

Solubility(ies)

Water solubility : 1.5 g/l (25 °C)

Partition coefficient: n-

octanol/water

: log Pow: 0.025 (25 °C)

Autoignition temperature : > 743 °C

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.



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Particle size Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity Not classified as a reactivity hazard.

Stable if used as directed. Follow precautionary advice and Chemical stability

avoid incompatible materials and conditions.

tions

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.

Ingredients:

1,1,1,2-Tetrafluoroethane:

Acute inhalation toxicity : LC50 (Rat): > 567000 ppm

> Exposure time: 4 h Test atmosphere: gas

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

Skin corrosion/irritation

Not classified based on available information.



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Ingredients:

1,1,1,2-Tetrafluoroethane:

Species: Rabbit

Result: No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Ingredients:

1,1,1,2-Tetrafluoroethane:

Species: Rabbit

Result: No eye irritation

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Ingredients:

1,1,1,2-Tetrafluoroethane:

Routes of exposure: Skin contact

Species: Guinea pig Result: negative

Species: Rat Result: negative

Germ cell mutagenicity

Not classified based on available information.

Ingredients:

1,1,1,2-Tetrafluoroethane:

Germ cell mutagenicity -

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

Assessment

_

Carcinogenicity

Not classified based on available information.

Ingredients:

1,1,1,2-Tetrafluoroethane:

Carcinogenicity - Assess-

ment

: Weight of evidence does not support classification as a car-

cinogen

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.



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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.

Ingredients:

1,1,1,2-Tetrafluoroethane:

Reproductive toxicity - As-

: Weight of evidence does not support classification for

sessment reproductive toxicity

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Not classified based on available information.

Ingredients:

1,1,1,2-Tetrafluoroethane:

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

Repeated dose toxicity

Ingredients:

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

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Ingredients:

1,1,1,2-Tetrafluoroethane:

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



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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

Persistence and degradability

Ingredients:

1,1,1,2-Tetrafluoroethane:

Biodegradability : Result: Not readily biodegradable.

Bioaccumulative potential

Ingredients:

1,1,1,2-Tetrafluoroethane:

Partition coefficient: n-

octanol/water

: log Pow: 1.06

Mobility in soil

No data available

Other adverse effects

Product:

Results of 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).

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.



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SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number UN 3159

Proper shipping name 1,1,1,2-TETRAFLUOROETHANE

2.2 Class

Packing group Not assigned by regulation

Labels 2.2

IATA-DGR

UN 3159 UN/ID No.

1,1,1,2-Tetrafluoroethane Proper shipping name

Class 2.2

Not assigned by regulation Packing group

Labels Non-flammable Gas 200

Packing instruction (cargo

aircraft)

Packing instruction (passen- :

200

ger aircraft)

IMDG-Code

UN number UN 3159

Proper shipping name 1,1,1,2-TETRAFLUOROETHANE

Class 2.2

Packing group Not assigned by regulation

Labels 2.2 F-C, S-V **EmS Code** 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 3159

Proper shipping name : 1,1,1,2-Tetrafluoroethane

Class 2.2

Packing group Not assigned by regulation Labels **NON-FLAMMABLE GAS**

ERG Code 126 Marine pollutant no

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

Ingredients	CAS-No.	Component RQ	Calculated product RQ	
_		(lbs)	(lbs)	
Hydrochloric acid	7647-01-0	5000	*	

^{*:} Calculated RQ exceeds reasonably attainable upper limit.



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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 : Sudden Release of Pressure Hazard

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.

US State Regulations

Pennsylvania Right To Know

1,1,1,2-Tetrafluoroethane

811-97-2

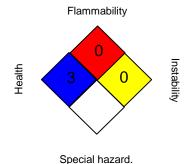
California Prop. 65

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

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS® IV:



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.

Full text of other abbreviations

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



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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

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Chemours(TM) 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.

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 : 05/19/2017

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.

US / Z8