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

1.1. Product identifier

Product name	: R-134a
Common chemical name	: 1,1,1,2-Tetrafluoroethane
CAS nr	: 811-97-2
EC Number	: 212-377-0
REACH registration numbe	: 01-2119459374-33

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

1.2.1 Relevant identified uses	: Refrigerant

1.3. Details of the supplier of the safety data sheet

Name	: DEHON SERVICE
Address	: 26, Avenue du Petit Parc 94683 VINCENNES cedex FRANCE
Telephone number	: +33 (0) 1 43 98 75 00
Telefax number	: +33 (0) 1 43 98 21 51
e-mail	: ContactFDS@climalife.dehon.com
1.4 Emergency telephone number	: EMERGENCY TELEPHONE NUMBER (24h/24) : + 33 (0) 1 72 11 00 03 Anti-poison Center : INRS/ORFILA (France) : +33 (0) 1 45 42 59 59 Anti-poison Centre (Spain) : +34 91 562 04 20 Anti-poison Centre (Belgium) : +32 70 245 245 Anti-poison Centre (Netherlands) : +31 30 274 8888 Anti-poison Centre (United Kingdom) : +44 870 600 6266 Poisons Information Centre (Hungary) : +36 80 201 199

SECTION 2 Hazards identification

2.1. Classification of the substance or mixture

2.1.1. Regulation (EC) No 1272/2008 (CLP)

Physical hazards	: Gases under pressure - Liquefied gas (Press. Gas) - H280
2.1.2 Directive EEC/67/548 or 1999/45/ CE	: Not classified as dangerous product.

2.2. Label elements

Hazard pictograms

Signal words	: Warning
Hazard statements	: Contains gas under pressure; may explode if heated
Precautionary statements :	
• Storage	: P410 + P403 : Protect from sunlight Store in a well-ventilated place
- Further data	: Greenhouse fluorinated gas falling within Kyoto Protocol

2.3. Other hazards

SECTION 2 Hazards identification (continued)

Adverse human health effects : Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing
Contact with liquid may cause frostbite and serious damage to eyes

Physical and chemical hazards : : Under certain temperature and pressure conditions may form a flammable mixture in the presence of air.

SECTION 3 Composition/information on ingredients

3.1./3.2. Substance / Preparation : Substance.

Components contributing to the hazard :

Substance name		Contents	CAS No	EC No	Index No	Ref REACH	Classification
1,1,1,2-Tetrafluoroethane	:	100 %	811-97-2	212-377-0	-----	01-2119459374-33	Not classified. (DSD/DPD) --- Liquefied gas;H280

SECTION 4 First aid measures

4.1. Description of first aid measures

Inhalation : Move the affected person away from the contaminated area and into the fresh air
If the person feels unwell :
Call a doctor

Skin contact : In the event of contact with the liquid: treat resulting frostbite as a burn
Immediately remove contaminated clothing or footwear
Immediately rinse with plenty of water
If skin burns appear, call a doctor immediately

Eye contact : Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum)
Consult an eye specialist immediately

Ingestion : Not specifically applicable (gas)

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

Acute symptoms : Central Nervous System depressant
Narcotic effect
Cardiac disorders

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

SECTION 5 Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media : All extinguishing agents can be used

Unsuitable extinguishing media : None to our knowledge. If there is a fire close by, use suitable extinguishing agents

5.2. Special hazards arising from the substance or mixture

Specific hazards : Pressure increase
Under certain temperature and pressure conditions may form a flammable mixture in the presence of air
On heating :
Toxic and corrosive vapours are released

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SECTION 5 Fire-fighting measures (continued)

5.3. Advice for firefighters

Specific fire fighting methods : Cool down the containers exposed to heat with a water spray

Protection of fire-fighters : Self-contained breathing apparatus
Complete protective clothing

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures : Avoid contact with skin and eyes
Remove all sources of ignition
Do not smoke
Evacuate the danger area.
Do not breathe vapours
Stop the leak.

6.2. Environmental precautions : -

6.3. Methods and material for containment and cleaning up : Mechanically ventilate the spillage area.

6.4 Reference to other sections : For further information refer to section 8 "Exposure controls/personal protection"

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Technical measures : Ventilation

Industrial hygiene : Do not drink, eat or smoke in the workplace

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

- Recommended : Store :
- in a cool, well-ventilated area
- away from any source of ignition
- away from any source of heat

Incompatible products : Strong oxidizing agents
Alkaline hydroxide
Alkaline earth metals
Finely divided metals (Mg, Al, Zn)

Packaging materials

- Recommended : Ordinary steel
Stainless steel

- Not suitable : Plastic materials.
Alloys containing more than 2% magnesium

7.3. Specific end use(s)

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SECTION 8 Exposure controls/personal protection

8.1. Control parameters

Engineering measures : Ensure good ventilation of the work station

* **8.1.1. Occupational Exposure Limits** : 1,1,1,2-Tetrafluoroethane : United Kingdom : WEL - TWA (8h; mg/m³) : 4240
1,1,1,2-Tetrafluoroethane : United Kingdom : WEL - TWA (8h; ppm) : 1000
1,1,1,2-Tetrafluoroethane : Germany : MAK - TWA (8h; mg/m³) : 4200
1,1,1,2-Tetrafluoroethane : Germany : MAK - TWA (8h; ppm) : 1000
1,1,1,2-Tetrafluoroethane : Germany : TRK - STEL (15min; mg/m³) : 33600
1,1,1,2-Tetrafluoroethane : Germany : TRK - STEL (15min; ppm) : 8000

8.2. Exposure controls

Personal protection :

- Respiratory protection : In the event of insufficient ventilation: Mask with AX canister
In a confined area : Self-contained breathing apparatus (ARI)
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing

- Hand protection : Leather or nitrile-rubber protective gloves
Protective gloves made of Viton

- Eye protection : Sealed safety goggles with side shields

- Skin protection : Majority cotton clothing

SECTION 9 Physical and chemical properties

9.1. Information on basic physical and chemical properties

9.1.a. Appearance

Physical state : Liquefied gas

Colour : Colourless

9.1.b. Odour : slightly ethereal.

9.1.c. Odour threshold : No data

9.1.d. pH : Not applicable

9.1.e. Melting point / Freezing point : -101 °C

9.1.f. Initial boiling point - boiling range : -26.4 °C

9.1.g. Flash point : None

9.1.h. Evaporation rate : > 1 / CCl4

9.1.i. Flammability : Non flammable.

9.1.j. Explosion limits (lower - upper) : Not applicable

9.1.k. Vapour pressure : 5.7 Bar absolute at 20 °C
13.2 Bar absolute at 50 °C

9.1.l. Vapour density : 3.6

9.1.m. Density : 1103 kg/m³ at 50 °C
1226 kg/m³ at 20 °C

9.1.n. Solubility

-in water : 0.9 g/l

9.1.o. Partition coefficient : n-octanol / water : 1.06 (log POW)

9.1.p. Auto-ignition temperature : +743 °C

9.1.q. Thermal decomposition : > +370 °C

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SECTION 9 Physical and chemical properties (continued)

9.1.r. Viscosity : Not applicable
9.1.s. Explosive Properties : Not explosive material according to EC criteria
9.1.t. Oxidising properties : Non oxidizing material according to EC criteria
9.2. Other information
Critical temperature : : +101 °C
Critical pressure : : 4070 kPa

SECTION 10 Stability and reactivity

10.1. Reactivity
10.2. Chemical stability : Stable at ambient temperature and under normal conditions of use
10.3. Possibility of hazardous reactions
10.4. Conditions to avoid : Under certain temperature and pressure conditions may form a flammable mixture in the presence of air.
10.5. Incompatible materials : - alkalis and caustic products
- alkaline earth metals.
- strong oxidizing agents
- finely divided metals (Al, Mg, Zn)

10.6. Hazardous decomposition products : : On thermal decomposition (pyrolysis), releases :
Carbon oxides (CO, CO2)
Hydrogen fluoride

SECTION 11 Toxicological information

11.1. Information on toxicological effects
Acute toxicity
On ingredients
1,1,1,2-Tetrafluoroethane : Rat inhalation LC50 [ppm/4h] : > 500000
Skin corrosion/irritation : Not irritating to rabbits on cutaneous application
Serious eye damage/irritation : Not irritating to rabbits on ocular application
Respiratory or skin sensitization : No sensitizing effect is known
Germ cell mutagenicity : No mutagenic effect
Carcinogenicity : No carcinogenic effect
Reproductive toxicity : No teratogenic effect
STOT-single exposure : No specific data
STOT-repeated exposure : No specific data
Aspiration hazard : Not applicable
Other information : Contact with liquid causes frostbite.
Contact with liquefied gas may cause severe ocular lesions

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SECTION 12 Ecological information

12.1. Toxicity

Effects on the aquatic environment

On ingredients

1,1,1,2-Tetrafluoroethane : 6 Hours - EC50 - Bacteria (Methanogens) [mg/l] : > 730
: 48 Hour - EC50 - Daphnia magna [mg/l] : 930
: 96 Hours - LC50 - Fish [mg/l] : 450

12.2. Persistence and degradability

Persistence : Product persists
Half-life in air : 8.6 - 16.7 y

Degradability :

12.3. Bioaccumulative potential

Octanol/water partition coefficient : 1.06

12.4. Mobility in soil : -

12.5. Results of PBT and vPvB assessment : -

12.6. Other adverse effects

Ozone depletion potential : ODP (R-11=1)=0

Greenhouse effect : GWP (CO_2=1/100 years) = 1430

SECTION 13 Disposal considerations

13.1. Waste treatment methods

CONTAMINATED PACKAGING :

Destruction/Disposal : Reuse or recycle following decontamination.
Destroy at an authorised site

NOTE : The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal

SECTION 14 Transport information

14.1. UN number : 3159

14.2. UN proper shipping name : 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A)

14.3. Transport hazard class(es)

Rail/road (RID/ADR) : Class : 2

Sea transport : Class : 2.2

Air transport (OACI/IATA) : Class : 2.2

Hazard Label(s) : 2.2

14.4. Packing group : Not applicable

14.5. Environmental hazards : Not classified as dangerous to the aquatic environment
Marine pollutant : NO

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SECTION 14 Transport information (continued)

14.6. Special precautions for user

Rail/road (RID/ADR)	:	Tunnel restriction code : (C/E) Hazard identification number : 20 Classification code : 2A
Sea transport	:	EmS Nr : F-C,S-V Segregation group : -
Air transport (OACI/IATA)	:	Cargo aircraft: Packing instruction: 200 Quantity: 150 kg Passenger aircraft: Packing instruction: 200 Quantity: 75 kg
NOTE	:	The above regulatory prescriptions are those valid on the date of publication of this sheet However, given the possible evolution of transport regulations for hazardous materials, in case the present sheet is dating back to more than 12 months ago, it would be advisable to check their validity with your commercial agency

SECTION 15 Regulatory information

	15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture	:	Ensure all national/local regulations are observed.
*	**France**	:	Classified Installations : applicable
	Germany :	:	WGK (Water-endangermant class) : 1
	REGULATION EC No 842/2006	:	Greenhouse fluorinated gas falling within Kyoto Protocol

15.2. Chemical safety assessment

SECTION 16 Other information

Further information	:	Product for professional use only For more information regarding the use of this product, please refer to our technical information or contact the sales department in your region This safety data sheet has been written in conformity with the regulation (UE) 453/2010.
Text of H-Phrases in § 3	:	H280 - Contains gas under pressure; may explode if heated
*** Update**	:	Modifications are indicated by an asterisk (*)

This sheet complements the technical sheets but does not replace them. The information given is based on our knowledge of the product, at the time of publication. It is given in good faith.
Besides, the attention of the user is drawn to the possible risks incurred by using the product for any other use than that for which it was intended.
In no way does this exempt the user from knowing and applying all the regulations controlling his activity. He alone will take on the responsibility for taking the precautions involved by the use of the product.
The aim of all the mandatory regulations mentionned is just to help the user to fulfil his obligations regarding the use of hazardous products.

This information must not be considered exhaustive. It does not exempt the user from ensuring that other obligations than those mentioned could apply, related to the storage and use of the product, this being his sole responsibility.

End of document

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