

Trade name: R134a

Current version : 4.0.0, issued: 24.10.2022

Replaced version: 3.0.0, issued: 12.04.2021

Region: GB

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name

**R134a**

Substance name 1,1,1,2-tetrafluoroethane

**Identification numbers**

CAS no. 811-97-2

EC no. 212-377-0

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

Industrial Use

Professional use

Refrigerant

**Uses advised against**

Consumer use

**1.3 Details of the supplier of the safety data sheet****Address**

Eppendorf SE

Barkhausenweg 1

D-22339 Hamburg

Telephone no. +49 40 53801-0

**Information provided by / telephone**

email: certificates@eppendorf.com

**Advice on Safety Data Sheet**

sdb\_info@umco.de

**1.4 Emergency telephone number**

For medical advice (in German and English):

+49 (0)551 192 40 (Giftinformationszentrum Nord)

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****Classification in accordance with Regulation (EC) No 1272/2008 (CLP)**

Press. Gas; H280

**Classification information**

This product is assessed and classified using the methods and criteria below referred to in Article 9 of Regulation (EC) n° 1272/2008:

Physical hazards: determined through assessment data based on the methods or standards referred to in part 2 of Annex I to CLP

Health hazards and environmental hazards: determined through toxicological and ecotoxicological assessment data based on the methods or standards referred to in Part 3 and 4 of Annex I to CLP.

**2.2 Label elements****Labelling according to Regulation (EC) No 1272/2008 (CLP Regulation)****Product identifier**

811-97-2 (norflurane)

**Hazard pictograms**

GHS04

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## Signal word

Warning

## Hazard statement(s)

H280 Contains gas under pressure; may explode if heated.

## Precautionary statement(s)

-

### 2.3 Other hazards

Danger of suffocation by displacement of air / oxygen. Contact with the liquid can cause cold burns or frostbite. Please observe the information given in this safety data sheet.

PBT assessment

The product is not considered to be a PBT.

vPvB assessment

The product is not considered to be a vPvB.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

#### Chemical characterization

Substance name 1,1,1,2-tetrafluoroethane

Formula C<sub>2</sub>H<sub>2</sub>F<sub>4</sub>

Molecular weight 102.04

#### Identification numbers

CAS no. 811-97-2

EC no. 212-377-0

### 3.2 Mixtures

Not applicable. The product is not a mixture.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

#### General information

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove affected person from danger area, lay him down. Seek medical advice immediately.

#### After inhalation

Remove affected persons from dangerous area by observing suitable respiratory protection measures. Ensure supply of fresh air. Irregular breathing/no breathing: artificial respiration. Call a doctor immediately.

#### After skin contact

In case of contact with skin wash off immediately with soap and water. Rinse with much water in case of frostbites. Remove clothes only after unfreezing. Cover wounds with sterile dressing. Call a doctor immediately.

#### After eye contact

Remove contact lenses. Rinse eye thoroughly under running water keeping eyelids wide open and protecting the unaffected eye (at least 10 to 15 minutes). Seek medical assistance.

#### After ingestion

Rinse the mouth thoroughly with water. Do not induce vomiting. Never give anything by mouth to an unconscious person.

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

#### Symptoms

The following symptoms may occur: respiratory arrest. Shortness of breath; Light-headedness; muscle incoordination; Unconsciousness; cardiac arrhythmia; Nausea; headaches; Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. May be fatal if inhaled.

### 4.3 Indication of any immediate medical attention and special treatment needed

Do not administer any preparations of the adrenaline-ephedrine group. Treat symptomatically.

## SECTION 5: Firefighting measures

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**5.1 Extinguishing media****Suitable extinguishing media**

Extinguishing powder; Water spray jet; Water mist; Foam; Carbon dioxide; Extinguishing measures to suit surroundings.

**Unsuitable extinguishing media**

High power water jet

**5.2 Special hazards arising from the substance or mixture**

In the event of fire, the following can be released: Carbon monoxide and carbon dioxide; Hydrogen fluoride (HF); Carbonyl fluoride; May explode if exposed to heat. Liquefied gas: Spilled liquid can cause cold burns. This gas is heavier than air and may accumulate in low areas.

**5.3 Advice for firefighters**

Use self-contained breathing apparatus. Wear full protective suit. Containers close to fire should be transferred to a safe place. Cool closed containers exposed to fire with water. Pressure increase, bursting and explosion hazard during heating. Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures****For non-emergency personnel**

Refer to protective measures listed in sections 7 and 8. Provide good room ventilation even at ground level (vapours are heavier than air). Do not breathe gas. Keep away from ignition sources. Use personal protective clothing. Cordon and mark contaminated area. Remove persons to safety.

**For emergency responders**

No data available. Personal protective equipment (PPE) - see Section 8.

**6.2 Environmental precautions**

Avoid release in the environment. Suppress gases/vapours/mists with water spray jet.

**6.3 Methods and material for containment and cleaning up**

Ensure adequate ventilation. Dispose of absorbed material in accordance with the regulations.

**6.4 Reference to other sections**

Information regarding safe handling, see section 7. Information regarding personal protective measures, see section 8. Information regarding waste disposal, see section 13.

**SECTION 7: Handling and storage****7.1 Precautions for safe handling****Advice on safe handling**

Only qualified and trained persons are authorised to handle. Provide good ventilation at the work area (local exhaust ventilation, if necessary). To be used only according to instructions for use. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers heat or sources of ignition. In case of accidental release: danger due to low temperature of the liquid product. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Comply with the health and safety at work laws.

**General protective and hygiene measures**

Wash hands before breaks and after work. Do not inhale gases. Do not eat, drink or smoke during work time. Keep away from foodstuffs and beverages. Have emergency shower available.

**Advice on protection against fire and explosion**

The product is not combustible. The substance can form a combustible mixture with air at elevated pressure. Isolate from sources of heat, sparks and open flame. Take precautionary measures against electrostatic loading (earthing necessary during loading operations). Electrical equipment should be protected to the appropriate standard.

**7.2 Conditions for safe storage, including any incompatibilities****Technical measures and storage conditions**

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Keep container tightly closed in a cool, well-ventilated place, open and handle carefully. Protect from heat and direct sunlight.

## Recommended storage temperature

Value < 50 °C

## Requirements for storage rooms and vessels

Containers which are opened must be carefully closed and kept upright to prevent leakage. Always keep in containers of same material as the original.

## Incompatible products

Substances to be avoided, see section 10.

## 7.3 Specific end use(s)

No data available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limit values

No	Substance name	CAS no.	EC no.
1	norflurane	811-97-2	212-377-0
List of approved workplace exposure limits (WELs) / EH40			
1,1,1,2-Tetrafluoroethane (HFC134a)			
	WEL long-term (8-hr TWA reference period)	4240	mg/m <sup>3</sup> 1000 ppm

### 8.2 Exposure controls

#### Appropriate engineering controls

Ensure adequate ventilation, local exhaust at the work station if necessary. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

#### Personal protective equipment

##### Respiratory protection

Self-contained breathing apparatus. In case of insufficient ventilation or long-term effect use breathing apparatus. Danger of suffocation due to high concentrations in breathing air.

Respiratory filter (gas) : AX

##### Eye / face protection

Tightly fitting safety glasses (EN 166).

##### Hand protection

Low-temperature-resistant gloves (EN 511). Sufficient protection is given wearing suitable protective gloves checked according to i.e. EN 374, in the event of risk of skin contact with the product. Before use, the protective gloves should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer's instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Design operations thus to avoid permanent use of protective gloves.

Appropriate Material Leather

##### Other

Chemical-resistant work clothes. Protective shoes.

#### Environmental exposure controls

Information regarding waste disposal, see chapter 13.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

<b>State of aggregation</b>
gas
<b>Form</b>
liquified gas
<b>Colour</b>

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colourless		
<b>Odour</b>		
slightly like ether		
<b>pH value</b>		
No data available		
<b>Boiling point / boiling range</b>		
Value	-26	°C
Reference pressure	1013	hPa
<b>Melting point/freezing point</b>		
No data available		
<b>Setting point / solidification range</b>		
Value	-108	°C
Reference pressure	1013	hPa
<b>Decomposition temperature</b>		
No data available		
<b>Flash point</b>		
No data available		
<b>Ignition temperature</b>		
No data available		
<b>Auto-ignition temperature</b>		
Value	743	°C
<b>Oxidising properties</b>		
The product does not have oxidizing properties.		
<b>Flammability</b>		
The product is non-flammable.		
<b>Lower explosion limit</b>		
No data available		
<b>Upper explosion limit</b>		
No data available		
<b>Vapour pressure</b>		
Value	5700	hPa
Reference temperature	20	°C
<b>Relative vapour density</b>		
No data available		
<b>Evaporation rate</b>		
Value	> 1	
Comments	CCl4 = 1	
<b>Relative density</b>		
Value	4.24	
Reference temperature	20	°C
<b>Density</b>		
No data available		
<b>Solubility in water</b>		
Value	1	g/l
Reference temperature	25	°C
<b>Solubility</b>		
No data available		
<b>Partition coefficient n-octanol/water (log value)</b>		

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No data available

## Kinematic viscosity

No data available

## Particle characteristics

No data available

## 9.2 Other information

### Other information

No data available.

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Dangerous reactions are not expected if the product is handled according to its intended use. For the avoidance of thermal reaction does not overheat.

### 10.2 Chemical stability

Stable under recommended storage and handling conditions (See section 7).

### 10.3 Possibility of hazardous reactions

Stable under recommended storage and handling conditions (See section 7).

### 10.4 Conditions to avoid

Temperatures > 50°C. Heat, naked flames and other ignition sources.

### 10.5 Incompatible materials

Alkali metals; Earth alkali metals; Metal as powder; powdered metal salts

### 10.6 Hazardous decomposition products

None, if handled according to intended use. In case of fire: see section 5.

## SECTION 11: Toxicological information

### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

#### Acute oral toxicity

No data available

#### Acute dermal toxicity

No data available

#### Acute inhalational toxicity

No data available

#### Skin corrosion/irritation

No data available

#### Serious eye damage/irritation

No data available

#### Respiratory or skin sensitisation

No data available

#### Germ cell mutagenicity

No data available

#### Reproduction toxicity

No data available

#### Carcinogenicity

No data available

#### STOT - single exposure

No data available

#### STOT - repeated exposure

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No data available

## Aspiration hazard

No data available

## 11.2 Information on other hazards

### Endocrine disrupting properties

No data available.

### Other information

No data available.

## SECTION 12: Ecological information

### 12.1 Toxicity

#### Toxicity to fish (acute)

No data available

#### Toxicity to fish (chronic)

No data available

#### Toxicity to Daphnia (acute)

No data available

#### Toxicity to Daphnia (chronic)

No data available

#### Toxicity to algae (acute)

No data available

#### Toxicity to algae (chronic)

No data available

#### Bacteria toxicity

No data available

### 12.2 Persistence and degradability

No data available.

### 12.3 Bioaccumulative potential

No data available.

### 12.4 Mobility in soil

No data available.

### 12.5 Results of PBT and vPvB assessment

#### Results of PBT and vPvB assessment

PBT assessment

The product is not considered to be a PBT.

vPvB assessment

The product is not considered to be a vPvB.

### 12.6 Endocrine disrupting properties

No data available.

### 12.7 Other adverse effects

#### Other adverse effects

Global Warming Potential (GWP): 1430

### 12.8 Other information

#### Other information

Do not discharge product unmonitored into the environment.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

#### Product

dispose of in accordance with local regulation.

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Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company.

## Packaging

Compressed gas packaging under pressure. Do not open by force. Do not heat above 50°C. Dispose of compressed gas packagings only if completely discharged. Do not burn empty compressed gas packagings. Do not pierce, cut or weld uncleaned containers.

## SECTION 14: Transport information

### 14.1 Transport ADR/RID/ADN

Class	2
Classification code	2A
Hazard identification no.	20
UN number	UN3159
Proper shipping name	1,1,1,2-TETRAFLUOROETHANE
Tunnel restriction code	C/E
Label	2.2

### 14.2 Transport IMDG

Class	2.2
UN number	UN3159
Proper shipping name	1,1,1,2-TETRAFLUOROETHANE
EmS	F-C, S-V
Label	2.2

### 14.3 Transport ICAO-TI / IATA

Class	2.2
UN number	UN3159
Proper shipping name	1,1,1,2-Tetrafluoroethane
Label	2.2

### 14.4 Other information

No data available.

### 14.5 Environmental hazards

Information on environmental hazards, if relevant, please see 14.1 - 14.3.

### 14.6 Special precautions for user

To be transported always in closed, upright and safe containers. Make sure that persons handling these containers are aware of the rules of conduct in case of incident or spillage.

### 14.7 Maritime transport in bulk according to IMO instruments

Not relevant

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### EU regulations

#### **Regulation (EC) No 1907/2006 (REACH) Annex XIV (List of substances subject to authorisation)**

In accordance with the REACH regulation (EC) 1907/2006, the product does not contain any substances that are considered as subject to listing in annex XIV, inventory of substances requiring authorisation.

#### **REACH candidate list of substances of very high concern (SVHC) for authorisation**

In accordance with article 57 and article 59 of the Reach regulation (EC) 1907/2006, this substance is not considered as subject to listing in annex XIV, inventory of substances requiring authorisation ("Authorization list").

#### **Regulation (EC) No 1907/2006 (REACH) Annex XVII: RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES**

The substance is not subject to the provisions of annex XVII (restriction entries) of the Reach regulation (EC) 1907/2006.

#### **Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances**

This substance is not subject to Part 1 or 2 of Annex I



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## Other regulations

REGULATION (EU) No 517/2014 on fluorinated greenhouse gases  
Adhere to the national sanitary and occupational safety regulations when using this product.

## 15.2 Chemical safety assessment

A chemical safety assessment has been carried out for this substance.

## SECTION 16: Other information

### Sources of key data used to compile the data sheet:

Regulation (EC) No 1907/2006 (REACH), 1272/2008 (CLP) as amended in each case.

Directives 2000/39/EC, 2006/15/EC, 2009/161/EU, (EU) 2017/164.

National Threshold Limit Values of the corresponding countries as amended in each case.

Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

The data sources used to determine physical, toxic and ecotoxic data, are indicated directly in the corresponding section.

### Creation of the safety data sheet

UMCO GmbH

This information is based on our present knowledge and experience.

The safety data sheet describes products with a view to safety requirements.

It does not however, constitute a guarantee for any specific product properties and shall not establish a legally valid contractual relationship.

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