



## SAFETY DATA SHEET (SDS)

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### 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE COMPANY

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#### 1.1 Product identifier

Name of the substance:

Product name: R134a  
CAS number: 00811-97-2  
EC number: 212-377-0  
REACH number: 01-2119459374-33-0010

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against Recommended use:

Refrigerant  
Industrial and professional  
Expansion  
Aerosol propellant

#### 1.3 Details of the distributor providing the safety data sheet Distributor:

Alanko Ltd.  
Krankweiherweg 22  
53489 Sinzig - Germany  
Tel. +49 (0) 2642 99990 0  
Fax +49 (0) 2642 9999016  
info@alanko.de

#### 1.4 Emergency number

39 02 66101029 (24h / 24h)

### 2. POSSIBLE RISKS

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#### 2.1 Classification of the substance or mixture

Criteria of the GHS Directive 1272/2008/EC:  
Attention, Press. Gas, contains compressed gas

#### 2.2 Marking elements Symbols:



Instructions: Attention Danger warnings:

H280 Contains gas under pressure; may explode when heated.

Safety instructions:

P403 Store in a well-ventilated place.  
P410 Protect from sunlight  
P273 Avoid release into the environment  
P314 If you feel unwell, seek medical advice/attention



Special rules:

Contains greenhouse gas(s) specified by the Kyoto Protocol.

### 2.3 Other hazards

vPvB substances: none - PBT substances: none

Contact with the liquid can cause cold burns/frosting.

In high concentrations may cause suffocation.

Vapors are heavier than air and may cause asphyxiation by displacing the oxygen in the air.

## 3. COMPOSITION/INFORMATION ON COMPONENTS

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### 3.1. substances

Name of the substance:

Product name: R134a

Chemical name:

1,1,1,2-tetrafluoroethane

### 3.2. mixtures N.A.

## 4. FIRST AID MEASURES

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### 4.1 Description of the first aid measure After skin contact:

In case of cold burns, rinse with water for at least 15 minutes. Cover with sterile drape. Call in a doctor.

After eye contact:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After swallowing:

Do not induce vomiting. CALL A DOCTOR IMMEDIATELY.

After inhalation:

Remove victim to fresh air using self-contained breathing apparatus. Keep warm and quiet. Call a doctor.

In case of respiratory arrest, provide artificial respiration.

### 4.2 Main acute and delayed symptoms and effects

Misuse or intentional inhalation can be fatal, due to effects on the heart, without alarming symptoms., Other symptoms, possibly related to incorrect use or excessive inhalation are:, Narcotic effects, drowsiness, dizziness, confusion, loss of coordination, light-headedness or fainting, irregular heartbeat with a strange feeling in the chest, palpitations, anxiety, fainting, dizziness, or weakness High concentrations may cause suffocation. Symptoms may include loss of movement and consciousness. The victim does not notice the suffocation.

### 4.3 Indications of immediate medical help or special treatment

Treatment: None

## 5. FIRE FIGHTING MEASURES

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### 5.1 Extinguishing media

All known extinguishing agents can be used.

Extinguishing agents which must not be used for safety reasons: No special restrictions.

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

The product is not flammable in the air, in a state of temperature and normal pressure. Some of the product illustrations mixtures with air, under certain conditions of pressure may be flammable.

Avoid mixing the product with air, under pressure.

Certain mixtures of the product and chlorine may be flammable or reactive under certain conditions. Thermal decomposition causes the emission of highly toxic and corrosive fumes (hydrogen fluoride). See section 10. Containers may explode when heated.

Do not inhale the explosion or combustion gases.

### 5.3 Fire-fighting instructions Use suitable respiratory equipment.

If safety permits, remove undamaged containers from the immediate danger zone.

Cool containers/tanks with water spray.

## 6. ACCIDENTAL RELEASE MEASURES

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### 6.1 Personal precautions, protective equipment and emergency procedures

When entering the area, use a self-contained breathing apparatus, unless it is proven that the atmosphere is not dangerous.

Clear the area.

Ensure adequate ventilation.

Prevent entry into drains, basements, work pits or other places where accumulation could be dangerous.

Observe the protective measures listed in points 7 and 8.

### 6.2 Environmental protection measures

Do not discharge into the atmosphere.

### 6.3 Methods and materials for containment and cleaning Ventilate the environment.

### 6.4 Reference to other sections

See also sections 8 and 13

## 7. HANDLING AND STORAGE

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### 7.1 Handling and storage

Prevent backflow into the gas container.

Only use equipment suitable for this product and the intended pressure and temperature.



Avoid skin and eye contact and inhalation of vapours.

Only experienced and properly trained persons should handle compressed gases.

Tasks requiring the use of workers must be carried out in accordance with good industrial and safety practice.

Close the valve of the container after each use and after emptying, even if it is still connected.

Never attempt to repair valves or safety pressure relief devices on the tank. Replace the outlet caps or plugs and the valve protection cap as soon as the container is disconnected from the system.

Never use flames or electric heaters to increase pressure in the tank.

The product label is used to identify the contents of the gas cylinder and must not be removed or obscured.

Do not cut, drill, grind, weld or similar work on or near containers. Refer to section 8 for recommended protective equipment.

#### 7.2 Conditions for safe storage taking into account incompatibilities

All regulations and local requirements for the storage of containers must be observed. Always store in well-ventilated rooms. Impact protection.

Keep away from heat/sparks/open flames/hot surfaces.

Do not store at temperatures above 50°C.

Do not store containers under conditions that accelerate corrosion.

Incompatible materials:

See section 10 of the Material Safety Data Sheet for further information.

Information on storage rooms:

Sufficient ventilation of the rooms.

#### 7.3 Specific end uses

No data available

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTIVE EQUIPMENT

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### 8.1 Control parameters

LELT - 8 h TWA: 1000 ml/m<sup>3</sup>

LELT - 8 h TWA: 4240 mg/m<sup>3</sup>

DNEL: Worker Industry: 13936 mg/m<sup>3</sup> - Consumer: 2476 mg/m<sup>3</sup> - Exposure: Inhalation; Health: Chronic effects, systemic toxicity.

PNEC: Fresh water: 0.1 mg/l; sea water: 0.01 mg/l; water (temporary use/release): 1 mg/l; fresh water sediment: 0.75 mg/kg; water (sewage treatment plants): 73 mg/l.

### 8.2 Exposure controls

Technical protection measures:

Handle product in a closed system.

Provide general and local exhaust ventilation.

Ensure that concentrations of the product in the ambient air are sufficiently below the occupational exposure limit.

If required by the risk assessment, use the following protective devices Eye protection:

Wear safety goggles or fully-closed basket goggles for chemicals.



Skin protection: Protective clothing Hand protection:

Gloves, chemical resistant and waterproof

If it is possible or expected contact with the liquid product is possible, the gloves should be thermally insulated to avoid cold burns.

respiratory protection:

When entering the area, use self-contained breathing apparatus unless it is proven that the atmosphere is not dangerous.

Thermal hazards:

Contact with liquid may cause cold burns/frostburn.

Environmental exposure controls:

The refrigerant must comply with local regulations for limiting emissions to the atmosphere. See section 13 for specific methods of handling and disposal of gas.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### 9.1 Physical and chemical properties

Appearance and colour:

Colourless gas.

Odour:

Ether-like

Odor threshold:

N.V.

pH:

N.A.

Melting point/freezing point::

-108 ° C

Lower boiling point and boiling interval:

-26.5 ° C

Flammability solid/gas:

N.A.

Upper / lower flammability or explosion limits:

N.A.

Vapour density:

3.6 (aria=1)

Flash point:

N.A.

Evaporation:

N.V.

Vapour pressure:

5.7 bar (at 20°C)

density:

1.22 g/cm<sup>3</sup> (at 20°C)

Solubility (in water):

N.V.

Solubility (in other substances):

alcohols, chlorinated solvents, polyethylene, glycol

Partition coefficient (n-octanal/water):

1.06 (at 25°C)

Ignition temperature:

N.A.

Decomposition temperature:

N.V.

Viscosity:

N.V.

Explosion hazard:

N.A.

Reactive properties:

N.A.

### 9.2. further information

No data available

## 10. STABILITY AND REACTIVITY

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### 10.1 Reactivity



The product is not flammable in the air, in a state of temperature and normal pressure. Some of the product mixtures with air, under certain conditions of pressure may be flammable. Avoid mixing the product with air, under pressure.

Certain mixtures of the product and chlorine may be flammable or reactive under certain conditions. Thermal decomposition causes the emission of highly toxic and corrosive vapors (hydrogen fluoride)

#### 10.2 Chemical stability

Stable under normal conditions

#### 10.3 Possibility of hazardous reactions

May react violently in contact with alkali metals, alkaline earth metals.

#### 10.4 Conditions to avoid

From heat / sparks / open flames / hot surfaces - Do not smoke.

#### 10.5 Incompatible materials

Powdered metals, magnesium and alloys containing more than 2% magnesium, powdered Metal salts.

#### 10.6. hazardous decomposition products

Hydrogen fluoride by thermal decomposition and hydrolysis, carbon oxides, carbonyl fluoride, fluorocarbon.



## 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects Toxicological information on the substance: acute inhalation toxicity:

CL50/4h - rat = 567000 ppm

Corrosive/irritant effect on the skin: no effects known for this product.

severe eye damage/irritation: no effects known for this product.

Respiratory/skin sensitization: No effects known for this product.

Germ cell mutagenicity: no effects known for this product.

Carcinogenicity: No effects known for this product. Reproductive toxicity: No effects known for this product.

Specific target organ toxicity at single exposure: no effects known for this product. Specific target organ

toxicity at repeated exposure: no effects known for this product. Aspiration hazard: no effects known for

this product.

## 12. ENVIRONMENTAL INFORMATION

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### 12.1 Toxicity

Toxicity to fish: CL50/96h/ rainbow trout: 450 mg/l

Toxicity to aquatic plants: CE50/72h/Algae: >118 mg/l (1)

Toxicity to aquatic invertebrates: CE50/48h/Daphnia magna: 980 mg/l

(1) = The information given is based on data for similar substances

### 12.2 Persistence and degradability

Not easily biodegradable.

### 12.3 Potential of bioaccumulation

Bioaccumulation is unlikely

### 12.4 Mobility in soil

N.V.

### 12.5 Results of the classifications PBT and vPvB substances: None - PBT substances: None

### 12.6 Other adverse effects

Contains greenhouse gas(s) listed in the Kyoto Protocol.

Warming potential GWP: 1430

## 13. DISPOSAL INSTRUCTIONS

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### 13.1 Waste treatment procedures

If possible, recycle. Proceed according to local and national regulations. The destruction must be carried out in approved facility equipped to absorb and neutralize acid gases and other toxic processing products. Do not allow to enter the environment.



Do not discharge into the atmosphere.  
Recycle according to the manufacturer's instructions.

## 14. TRANSPORT INFORMATION

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### 14.1. UN number

ADR/RID/IMDG/IATA - UN number: 3159

### 14.2. proper UN shipping name:

ADR/RID/IMDG - UN proper shipping name: 1,1,1,2-TETRAFLUOROETHAN

IATA - Proper shipping name UN: 1,1,1,2-TETRAFLUOROETHAN

### 14.3 Transport classes and risks

ADR/RID - transport hazard classes: 2

ADR sticker: 2.2

RID sticker: 2.2 (+13)

ADR/RID - Number of hazard identification: 20

Classification code: 2A

IATA/IMDG - Transport hazard classes: 2.2

### 14.4. packing group

ADR/IMDG - Packaging group: -

### 14.5. environmental hazards: None

### 14.6 Special precautions for the user

ADR tunnel restriction code: C/E

IMDG Stowage and separation Cat. A

IMDG Emergency Schedules: F-C, S-V

Make sure that there is adequate ventilation.

The driver must know the possible dangers of the load and he must know what to do in case of an accident or emergency.

Observe applicable regulations.

Before transport:

- Secure container.
- The cylinder valve must be closed and tight.
- The valve lock nut or plug (if present) must be correctly fastened.
- The valve protection device (if present) must be correctly fastened.

If possible, do not transport in vehicles whose cargo area is not separated from the driver's cab.

### 14.7. carriage in bulk in accordance with Annex II of MARPOL 73/78 and the IBC Code: N.A.





## 15. LEGAL PROVISIONS

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15.1. safety, health and environmental protection regulations / specific legislation for the substance or mixture

Directive 67/548/EEC (classification, packaging and labelling of dangerous substances). Directive 99/45/EEC (classification, packaging and labelling of dangerous preparations). Directive 98/24/EC (protection of the health and safety of workers from the risks related to chemical agents at work). Directive 2000/39/EC (indicative occupational exposure limit values); Directive 2006/8/EC. Regulation (EC) No 1907/2006 (REACH), Regulation (EC) No 1272/2008 (CLP), Regulation (EC) No 790/2009 (1st ATP CLP), Regulation (EU) No 453/2010 (Annex I).

Where possible, reference to the following standards:

EEC Directive 2003/105/EEC ('activities liable to result in dangerous accidents') and subsequent amendments. Ministerial Decree 1999/13/EC (VOC Directive)

15.2 Chemical safety assessment: No

## 16. OTHER INFORMATION

Revised safety data sheet in accordance with Regulation (EU) No 453/2010.

Wearers of breathing apparatus must be trained accordingly.

This document has been prepared by a competent person to person who has received appropriate training.

Main literature:

ECHA: European Chemicals Agency

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX'S DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold CCNL EIGA (European Industrial Gases Association)

The information contained herein is based on our knowledge at the date indicated above. It refers only to the product specified and does not constitute a warranty of characteristics. The user must determine the suitability and completeness of this information in connection with the specific use.

Classification in accordance with the calculation methods according to Regulation (EC) No 1272/2008 (CLP) // Directive 1999/45/EC (DPD). This data sheet replaces all previous editions.

ADR: European Agreement concerning the international carriage of dangerous goods by road.

CAS: Chemical Abstracts Service (Division of the American Chemical Society).

CLP: Classification, packaging and labelling.

DNEL: Derived zero effect level.

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals.

IATA: International Air Transport Association.

IATA-DGR: International Air Transport Association regulations on the transport of dangerous goods

ICAO: International Civil Aviation Organisation.

ICAO-TI: Technical Instructions of the International Civil Aviation Organisation

IMDG: Dangerous goods labelling for dangerous goods in maritime transport.

LC50: lethal concentration for 50 percent of the test population.

LD50: lethal dose for 50 percent of the test population.

PNEC: Estimated no effect concentration.

RID: Regulation concerning the international carriage of dangerous goods by rail.



STE:	Short term exposure.
STEL:	Short term exposure limit.
STOT:	target organ toxicity.
TLV:	occupational exposure limit value.
TWATLV:	threshold value for time-weighted 8-hours-day (TWATLV) (ACGIH standard).
N.V:	not available
N.A.:	Not applicable
VLEP:	Air limit value
LELT:	Exposure limit values long-term