

Kryon® 134a

1. Identification of the Substance/Mixture and of the Company/Undertaking

Product name	: HFC-134a, Kryon® 134a
Type of product	: Substance
Chemical Name	: Norflurane
EC-N°.	: 212-377-0
Registration number	: 01-2119459374-33
Use of substance/mixture	: Refrigerant Propellant Heat transfer fluid
Uses advised against	: none
Identification of the company/undertaking	: General Gas S.r.l. Via Argine Ovest, 125 - 80146 NAPOLI ☎ +39-081-2280252 - 📠 +39-081-5590640
Emergency telephone number	☎ +3355644288
For further information	✉ m.migliaccio@gastec.it

2. Hazards Identification

Classification 67/548/EC or 1999/45/EC : This substance is not classified as dangerous according to Directive 67/548/EEC.

Classification according to EC N° 1272/2008 (SGH-CLP)

Gases under pressure Liquefied gas
 H280 Contains gas under pressure; may explode if heated.

Label elements REGULATION (EC) No 1272/2008

Hazard pictograms



Signal word	: Warning
Hazard statements	: H280 Contains gas under pressure; may explode if heated.
Precautionary statements	: P410 + P403 Protect from sunlight. Store in a wellventilated place.

DIRECTIVES 67/548/EEC or 1999/45/EC

Not a hazardous substance or mixture according to EC-directives 67/548/EEC or 1999/45/EC.
 The product does not need to be labelled in accordance with EC directives or respective national laws.

Additional label elements

Special labelling of certain products : Contains fluorinated greenhouse gases covered by the Kyoto Protocol.

Potential health effects

Skin	: Rapid evaporation of the liquid may cause frostbite.
Eyes	: May irritate eyes.
Ingestion	: Unlikely route of exposure.
Inhalation	: High vapour concentrations can cause headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. May cause cardiac arrhythmia.
Chronic Exposure	: None known.
Further information	: Warning! Container under pressure.

Potential environmental effects : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

3. Composition/Information on Ingredients

Chemical characterization

Chemical Name	: Norflurane
CAS-No.	: 811-97-2
EC-No.	: 212-377-0
Registration number	: 01-2119459374-33
Occupational Exposure Limit(s), if available, are listed in Section 8.	

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For the full text of the R-phrases/ H-statements mentioned in this Section, see Section 16.

4. First Aid Measures

- Inhalation : Remove to fresh air. Artificial respiration and/or oxygen may be necessary. Call a physician immediately.
 - Skin contact : Rapid evaporation of the liquid may cause frostbite. In case of contact with liquid, thaw frosted parts with water, then remove clothing carefully. Wash with plenty of water Consult a physician. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use.
 - Eye contact : Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
 - Ingestion : As this product is a gas, refer to the inhalation section. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician immediately.
 - Further information : Do not give adrenaline or similar drugs.
- See Section 11 for more detailed information on health effects and symptoms.

5. Firefighting Measures

- Suitable extinguishing media** : The product is not flammable. ASHRAE 34 Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- Specific hazards during firefighting** : Possibility of generating hazardous reactions during a fire due to the presence of F and Cl groups. Heating will cause pressure rise with risk of bursting Cool closed containers exposed to fire with water spray. This product is not flammable at ambient temperatures and atmospheric pressure. However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources.
- Special protective equipment for firefighters** : Wear full protective clothing and self-contained breathing apparatus.
- Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

6. Accidental Release Measures

- Personal precautions** : Immediately contact emergency personnel. Wear personal protective equipment. Unprotected persons must be kept away. Ensure adequate ventilation. In case of insufficient ventilation wear suitable respiratory equipment.
 - Environmental precautions** : Prevent further leakage or spillage if safe to do so. The product evaporates readily.
- For personal protection see section 8.

7. Handling and Storage

- Handling**
- Advice on safe handling : Open drum carefully as content may be under pressure. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material. Do not use in areas without adequate ventilation. Contaminated equipment (brushes, rags) must be cleaned immediately with water.
- Hygiene measures : Provide adequate ventilation. When using do not eat or drink.
- Storage**

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Further information on storage conditions : Store in original container. Keep away from direct sunlight.
Keep containers tightly closed in a cool, well-ventilated place.

8. Exposure Controls/Personal Protection

Occupational exposure limits

Components	Basis	Value type	Control parameters	Exceeding Factor	Form of exposure	Remarks
Norflurane	EH40 WEL	TWA	4.240 mg/m ³ 1.000 ppm	Exceeding Factor	Form of exposure	Remarks

TWA - time weighted average

Occupational exposure controls

The Personal Protective Equipment must be in accordance with EN standards:respirator EN 136, 140, 149; safety glasses EN 166; protective suit: EN 340, 463, 468, 943-1, 943-2; gloves EN 374, safety shoes EN-ISO 20345.

Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

Personal protective equipment

- Respiratory protection : Remarks: In case of insufficient ventilation wear suitable respiratory equipment.
- Hand protection : Glove material: Viton (R)
Break through time: > 480 min
Glove thickness: 0,7 mm
Vitoject® 890
Heat insulating gloves
Remarks: Supplementary note: The specifications are based on information and tests from similar substances by analogy.
Due to varying conditions (e.g.temperature or other strains) it must be considered that the usage of a chemical protective glove in practice may be much shorter than the permeation time determined in accordance with EN 374.
Since actual conditions of practical use often deviate from standardised conditions according EN 374 the glove manufacturer reccomends to use the chemical protective glove in practice not longer than 50% of the recomended permeation time. Manufacturer´s directions for use should be observed because of great diversity of types.
Suitable gloves tested according EN 374 are supplied e.g. from KCL GmbH, D-36124 Eichenzell, Vertrieb@kcl.de
- Eye protection : Safety glasses with side-shields conforming to EN166
Face-shield
- Skin and body protection : Protective footwear
- DNEL/ PNEC-Values
No DNEL-data available.
No PNEC data available.

9. Physical and Chemical Properties

- Form : Liquefied gas
- Colour : colourless
- Odour : weak
- molecular weight : 102,02 g/mol
- Melting point/range : -101 °C
- Boiling point/boiling range : -26,2 °C
- Flash point : not applicable
- Flammability (solid, gas) : no data available
- Ignition temperature : > 750 °C
- Lower explosion limit : no data available
- Upper explosion limit : no data available
- Vapour pressure : 5.915 hPa at 21,1 °C
- Vapour pressure : 14.713 hPa at 54,4 °C

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Density	: 1,2 g/cm ³
pH	: neutral
Water solubility	: 1,5 g/l
Partition coefficient: noctanol/water	: log Pow 1,06 The product is more soluble in octanol.
Relative vapour density	: 3,5
Evaporation rate	: > 1 Method: Compared to CCl ₄ .

10. Stability and Reactivity

Conditions to avoid	: Heating will cause pressure rise with risk of bursting. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material.
Materials to avoid	: oxidising substances. Possible incompatibility with alkali sensitive materials. Powdered metals.
Hazardous decomposition products	: Halogenated compounds Hydrogen fluoride Carbonyl halides Carbon oxides
Stability	: >250 °C

11. Toxicological information

Acute oral toxicity	: not applicable
Acute dermal toxicity	: no data available
Acute inhalation toxicity	: LC50 Species: rat Value: > 500000 ppm Exposure time: 4 h
Skin irritation	: no data available
Eye irritation	: no data available
Sensitisation	: no data available

12. Ecological Information**Ecotoxicity effects**

Toxicity to fish	: no data available
Toxicity to aquatic plants	: no data available
Acute toxicity to aquatic invertebrates	: no data available

Further information

Additional ecological information	: Accumulation in aquatic organisms is unlikely.
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13. Disposal Considerations

Product	: Offer surplus and non-recyclable solutions to a licensed disposal company. Refer to manufacturer/supplier for information on recovery/recycling.
Waste key for the unused product	: Classification: 14.06.01
Further information	: Provisions relating to waste: EC Directive 2006/12/EC; 91/689/EEC Regulation No. 1013/2006
For personal protection see section 8.	

14. Transport Information**ADR/RID**

UN Number	: 3159
Description of the goods	: 1,1,1,2-TETRAFLUOROETHANE
Class	: 2

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Classification Code : 2A
Hazard identification No : 20
ADR/RID-Labels : 2.2
Environmentally hazardous : no

IATA

UN Number : 3159
Description of the goods : 1,1,1,2-Tetrafluoroethane
Class : 2.2
Hazard Labels : 2.2

IMDG

UN Number : 3159
Description of the goods : 1,1,1,2-TETRAFLUOROETHANE
Class : 2.2
Hazard Labels : 2.2
EmS Number : F-C, S-V
Marine pollutant : no

15. Regulatory Information**Safety, health and environmental regulations/legislation specific for the substance or mixture**

Ozone Depletion Potential : 0
Global warming potential (GWP) : 1.430
Other regulations : EU Regulation 842/2006/E

16. Other Information

This Material Safety Data Sheet was written in accordance to the current European policies, and it is applicable to all the countries that have translated the policies within their national legislation.

The information contained in this sheet is based on our knowledge at the time of the last version. The user must make sure the information is complete and suitable for the specific use of the product. This document is not to be considered a warranty for any specific propriety of the product. Since the use of the product is not under our direct control, the user must observe on his/her own responsibility current laws and policies about hygiene and safety. We do not take any responsibility for any improper use.

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