

KRYON® 134A

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

Product Name : HFC-134a , Kryon®134a
Type of Product : Substance
SDS Nr : GG_024
Chemical Name : Tetrafluoroethane

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

Use of the Substance/Mixture :
: Refrigerant
: Propellant
Uses advised against : None

1.3. Details of the supplier of the safety data sheet

Company : General Gas S.r.l. – Via Aosta 5 – 20063 Cernusco S/N (MI) – Italy
Telephone : 0039-02-92141835
Telefax : 0039-02-92141841
For further information please contact :
: Marco Migliaccio – m.migliaccio@gas-tec.it

1.4. Details of the supplier of the safety data sheet

Emergency telephone number :
: 0039-335-5644288


SECTION 2: Hazards Identification**2.1. Emergency OverviewForm :**

Color : colourless
Odor : weak
Form: liquefied gas

2.2. Label Elements

REGULATION (EC) No 1272/2008

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Hazard pictograms	:	
Signal word	:	Warning
Hazard Statements	:	H280 Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation
Precautionary statements	:	Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards : May cause cardiac arrhythmia. May cause frostbite.

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3: Composition/Information on ingredients

3.1. Substance

Chemical Name	CAS-No. Index-No. Registration Number EC-No	Classification 1272/2008	Concentration	Formula
Tetrafluoroethane	811-97-2 01-2119459374-33 212-377-0	Press. Gas ;	100	CF ₃ CH ₂ F

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:

Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Use oxygen as required, provided a qualified operator is present. Call a physician. Do not give drugs from adrenaline-ephedrine group.

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Skin contact:

After contact with skin, wash immediately with plenty of water. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. If symptoms persist, call a physician.

Eye contact:

Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Ingestion:

Unlikely route of exposure. As this product is a gas, refer to the inhalation section. Do not induce vomiting without medical advice. Call a physician immediately.

Notes to physician:

Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions. Treat frost-bitten areas as needed.

SECTION 5: Firefighting measures**5.1. Extinguishing media****Suitable extinguishing media:**

The product is not flammable.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Extinguishing media which shall not be used for safety reasons:

High volume water jet

5.2. Special hazards arising from the substance or mixture

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.

5.3. Advice for firefighters

Wear full protective clothing and self-contained breathing apparatus.

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Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures**6.1. Personal Precautions, protective equipment and emergency procedures**

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.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. The product evaporates readily.

6.3. Methods and materials for containment and cleaning up

Ventilate the area.

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage**7.1. Precautions for safe 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.

7.2. Conditions for safe storage, including any incompatibilities*Further information on storage conditions:*

Store in original container. Keep away from direct sunlight. Keep containers tightly closed in a cool, well-ventilated place.

7.3. Specific end use(s)

no additional data available

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SECTION 8 : Exposure controls / personal protection

8.1. Control parameters

Occupational exposure limits :

Components	Basis / Value Type	Value / Form of exposure	Exceeding Factor	Remarks
Tetrafluoroethane	Twa	1'000 ppm		
Tetrafluoroethane	EH40 WEL TWA	4'240 mg/m3 1000 ppm		

TWA – Time weighted average

DNEL / PNEC-VALUES

Component	End-use / Impact	Exposure Duration	Value	Exposure routes	Remarks
Tetrafluoroethane	Workers / Long-term systemic effects		13936 mg/m3	Inhalation	
Tetrafluoroethane	Consumers / Long-term systemic effects		2476 mg/m3	Inhalation	

Component	Environmental compartment / Value	remarks
Tetrafluoroethane	Fresh water : 0,1 mg/l	Assessment factor : 1'000
Tetrafluoroethane	Marine water : 0,01 mg/l	Assessment factor : 10'000
Tetrafluoroethane	Fresh water sediment : 0,75 mg/kg	Assessment factor : 100
Tetrafluoroethane	Sew age treatment plant : 73 mg/l	Assessment factor : 10

8.2. Exposure controls

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.

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Personal protective equipment

Respiratory protection:

In case of insufficient ventilation wear suitable respiratory equipment.

Self-contained breathing apparatus (EN 133)

Hand protection:

Glove material: Viton (R) Break

through time: > 480 min Glove

thickness: 0,7 mm Vitoject®

890

Protective gloves against cold
(EN 511)

Gloves must be inspected prior to use.

Replace when worn.

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 recommends to use the chemical protective glove in practice not longer than 50% of the recommended 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

Environmental exposure controls

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

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Form : Liquefied gas

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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
Density	:	1,2 g/cm ³
pH	:	neutral
Water solubility	:	1,5 g/l
Partition coefficient:	:	
n- octanol/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 .

9.2. Other Information

no additional data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions. Hazardous polymerisation does not occur.

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10.2. Chemical stability

no data available

10.3. Possibility of hazardous reactions

no data available

10.4. 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.

10.5. Incompatible materials

oxidizing substance
Possible incompatibility with alkali sensitive materials.
Powdered metals

10.6. Hazardous decomposition products

Halogenated compounds Hydrogen fluoride Carbonyl halides Carbon oxides

SECTION 11: Toxicological information**11.1. Information on toxicological effects**

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

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Eye irritation:

no data available

Respiratory or skin sensitisation:

no data available

Carcinogenicity:

Note: Not classified as a human carcinogen. Substance not expected to be a carcinogen based on available data.

Germ cell mutagenicity:

Test Method: Ames test Result: negative
Method: OECD Test Guideline 471

Species: Mouse

Result: negative

Reproductive toxicity:

Species: Mouse Route of Application: Inhalation

General Toxicity - Parent: NOEL: 50.000 ppm

Method: OECD Test Guideline 414

Species: Rabbit

Route of Application: Inhalation

General Toxicity Maternal: NOEL: 2.500

ppm Embryo-fetal toxicity: NOEL: 40.000

ppm

Aspiration hazard:

no data available

Other information:

no data available

SECTION 12: Ecological Information**12.1. Toxicity***Toxicity to fish:*

LC50

semi-static test

Species: Oncorhynchus mykiss (rainbow
trout) Value: 450 mg/l

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Exposure time: 96 h

Method:

92/69/EEC,C.1

Toxicity to aquatic plants:

Growth rate

Species: Selenastrum capricornutum (green

algae) Value: > 118 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Toxicity to Microorganisms:

EC10

Growth inhibition

Species: Pseudomonas

putida Value: > 730 mg/l

Exposure time: 6 h

Toxicity to aquatic invertebrates:

EC50

static test

Species: Daphnia magna (Water

flea) Value: 980 mg/l

Exposure time: 48 h

Method: EEC 92/69/V, C2

12.2. Persistence and degradability

Biodegradability

: Biodegradation 3%

Exposure time: 28 d

Result: Not rapidly biodegradable

Method: OECD 301 D

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

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12.5. Results of PBT and vPvB assessment

Results PBT Assessment : This substance is not considered to be present, bioaccumulating and toxic (PBT).

This substance is not considered to be very persistent and very bioaccumulating (vPvB)

12.6. Other adverse effects

Accumulation in aquatic organisms is unlikely.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product:

Offer surplus and non-recyclable solutions to a licensed disposal company. Refer to manufacturer/supplier for information on recovery/recycling. Classification: 14.06.01

Further information:

Provisions relating to waste:
EC Directive 2006/12/EC;
2008/98/EEC
Regulation No. 1013/2006

For personal protection see section 8.

SECTION 14: Transport Information

ADR/RID

UN Number	:	3159
Description of the goods	:	1,1,1,2-TETRAFLUOROETHANE
Class	:	2
Classification Code	:	2A
Hazard Identification Number	:	20
ADR/RID-Labels	:	2.2
Environmentally hazardous	:	no

IATA

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

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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

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****Other inventory information**

US. Toxic Substances Control Act On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List

On the inventory, or in compliance with the inventory

Korea. Toxic Chemical Control Law (TCCL) List

On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances On the inventory, or in compliance with the inventory

NZIOC - New Zealand

On the inventory, or in compliance with the inventory

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15.2. Chemical safety assessment

A Chemical Safety Assessment has been carried out.

SECTION 16: Other information**Text of H-statements referred to under heading 3**

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

Further information

All directives and regulations refer to amended versions.
Vertical lines in the left hand margin indicate a relevant amendment from the previous version.

Abbreviations:

EC European Community
CAS Chemical Abstracts
Service DNEL Derived no
effect level PNEC Predicted
no effect level
vPvB Very persistent and very bioaccumulative
substance PBT Persistent, bioaccumulative und toxic
substance

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 given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.

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