



**Safety Data Sheet**

Product:

**R134a**

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**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY**

Product Name	1, 1, 1, 2-Tetrafluoroethane
Other/Generic Names	HCFC-134a, R134a
Chemical Formula	CF3CH2F
Product Use	Refrigerant
Company Identification	BNF Industries Pte Ltd 17 Changi South Street 1, Singapore 486781
Emergency phone number	(65) 6742 6118
Fax	(65) 6742 6119

**2. HAZARDS IDENTIFICATION**

Classification of the substance or mixture

Classification acc. to Regulation (EC) No. 1272/2008/EC  
H280 Gases under pressure: Compressed gas

Label elements

Hazard pictograms:



Signal word: Warning

**Hazard statement(s):**

H280 Contains gas under pressure; may explode if heated.  
May displace oxygen and cause rapid suffocation.

**Precautionary statements**

P410+P403 Protect from sunlight. Store in a well-ventilated place.

**Other hazards**

None

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance/Preparation:	Substance
Components/Impurities:	Contains no other components or impurities which will influence the classification of the product.
CAS No.:	811-97-2
Index No.:	-
EC No.:	212-377-0
REACH Registration No.:	01-2119459374-33

**4. FIRST AID MEASURES**

**First Aid Skin**

Promptly flush skin with water until all chemical is removed. 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. Get medical attention if symptoms persist.

**First Aid Eyes**

Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite, water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

**First Aid Inhalation**

Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine (adrenaline).

**First Aid Ingestion**

Ingestion is unlikely because of the physical properties and is not expected to be hazardous. DO NOT induce vomiting unless instructed to do so by a physician.

Advice 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.

**5. FIRE FIGHTING MEASURES**

**Suitable extinguishing media**

The product is not flammable. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Specific hazards during firefighting**

Contents under pressure. 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. Container may rupture on heating. Cool closed containers exposed to fire with water spray. Do not allow run-off from firefighting to enter drains or water courses. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

**Specific methods**

If possible, stop flow of product. Move container away or cool with water from a protected position.

**Special protective equipment for fire fighters**

Use self-contained breathing apparatus and chemically protective clothing.

**6. ACCIDENTAL RELEASE MEASURES**

**In case of Spill or Leak**

Use Halogen leak detector or other suitable means to locate leaks or check atmosphere. Keep unwind. Evacuate enclosed spaces and disperse gas with floor-level forced-air ventilation.



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Exhaust vapours outdoors. Do not smoke or operate internal combustion engines. Remove flames and heating elements.

Chemical Formula:	CF <sub>3</sub> CH <sub>2</sub> F
Odour:	Faint ethereal odour
Odor Threshold:	No data available
pH:	Neutral
Boiling Point:	-26 °C
Freezing Point:	-101 °C
Critical Temperature:	100.6 °C
Flash Point:	N/A
Evaporation Rate:	>1 (CCL4 = 1.0)
Flammability:	Non-flammable
Flammability Range:	None
Auto-ignition temperature:	>750 °C
Decomposition temperature:	>250 °C
Vapor Pressure:	5.7 bar (20 °C)
Vapor Density:	3.5 (air = 1.0)
Relative Density:	1.2 g/cm <sup>3</sup> (25 °C)
Water Solubility:	1.5 g/l (25 °C)
Partition coefficient, n-octanol/water:	log Pow: 1.06
Global warming potential (GWP):	1,300
Ozone depletion potential (ODP):	0

**7. HANDLING AND STORAGE**

**Normal Handling** (Always wear recommended PPE)  
Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

**Storage recommendations**

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

**8. EXPOSURE CONTROL/PERSONAL PROTECTION**

**Engineering controls**

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

**Eye/Face Protection**

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

**Skin Protection**

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

**Respiratory Protection**

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

**Additional Recommendations**

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quickdrench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance/Colour:	Clear, colourless liquid and vapour
Physical State:	Gas at ambient temperatures
Molecular Weight:	102 g/mol

**10. STABILITY AND REACTIVITY**

**Reactivity**

Not classified as a reactivity hazard.

**Chemical Stability**

Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.

**Possibility of hazardous reactions**

Hazardous polymerisation does not occur.

**Conditions to avoid**

Heat, flames and sparks

**Incompatible materials**

Oxidizing agents

**Hazardous decomposition products**

Halogenated compounds, hydrogen fluoride, carbonyl halides, carbon oxides.

**11. TOXICOLOGY INFORMATION**

**Acute toxicity**

LC50: Inhalation 4 hr. (rat) - > 500,000 ppm

Cardiac Sensitization threshold (dog) - 75,000 ppm

**Skin corrosion/irritation**

Not classified based on available information





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**Serious eye damage/eye irritation**

Not classified based on available information.

**Skin sensitization**

Not classified based on available information.

**Respiratory sensitization**

Not classified based on available information.

**Germ cell mutagenicity**

Not classified based on available information.

**Carcinogenicity**

Not classified based on available information.

**Reproductive toxicity**

Not classified based on available information.

**Aspiration toxicity**

Not classified based on available information.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

No known ecological damage caused by this product

**Toxicity to fish**

LC50 (Oncorhynchus mykiss, 96h): 450 mg/l

**Toxicity to daphnia and other aquatic invertebrates**

EC50 (Daphnia magna, 48h): 930 mg/l

**Biodegradability**

Not applicable to gases and gas mixtures.

**Bioaccumulative potential**

No data available

**Mobility in soil**

No data available

**Other adverse effects**

**Results of PBT and vPvB assessment**

Not classified as PBT or vPvB

**Global Warming Potential**

1.300

Contains fluorinated greenhouse gases covered by the Kyoto protocol. When discharged in large quantities may contribute to the greenhouse effect.

**13. DISPOSAL CONSIDERATIONS**

**Waste from residues**

Dispose of in accordance with local regulations

**Contaminated packaging**

Empty containers should be taken to an approved waste handling site for recycling or disposal.

Empty pressure vessels should be returned to the supplier. If not otherwise specified, dispose of as unused product.

**14. TRANSPORT INFORMATION**

**ADD/RID**

UN number: UN 3159  
Proper shipping name: 1, 1, 1, 2-Tetrafluoroethane  
Class: 2  
Classification code: 2A  
Hazard number: 20  
Tunnel restriction code: (C/E)  
Emergency action code: 2TE  
Packing group: P200  
Labels: 2.2

**IMDG**

UN number: UN 3159  
Proper shipping name: 1, 1, 1, 2-Tetrafluoroethane  
Class: 2.2  
Packing group: -  
Labels: 2.2  
EmS Code: F-C, S-V  
Marine pollutant: No

**IATA**

UN number: UN 3159  
Proper shipping name: 1, 1, 1, 2-Tetrafluoroethane  
Class: 2.2  
Packing group: -  
Labels: Non-flammable, non-toxic Gas  
Packing instruction: 200

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Other transport information**

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product, containers ensure that they are firmly secured. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations. Ensure that the container valve is closed and not leaking.

**15. REGULATORY INFORMATION**

**Classification and labelling**

The product may be due to classification and labelling according to national regulations in each case.

**Other regulation and guidance**

The provisions of occupational, health, environment and consumer protection shall apply to the country where the chemical substance or mixture is placed on the market.





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**16. OTHER INFORMATION**

Ensure all national/local regulations are observed. Ensure operators understand the flammability hazard. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

**Advice**

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

This MSDS is for information purposes only and is subject to change without notice.

