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| <b>MATERIAL SAFETY DATA SHEET</b>   |
| Title: <b>LIQUEFIED 1,1,1,2- TETRAFLUOROETHANE MATERIAL SAFETY DATA SHEET</b> |
| Date of Issue: 1 August 2018  |
| Date of Next Review: 1 August 2023  |

## MATERIAL SAFETY DATA SHEET 1, 1, 1, 2-TETRAFLUROETHANE



### IDENTIFICATION:

**Chemical Name:** 1,1,1,2 - Tetrafluoroethane  
**Synonyms:** R134a  
**UN Number:** 3159  
**Use:** Refrigerant Gas

### HAZARDS IDENTIFICATION:

**Dangerous Goods Class and Subsidiary Risk:** 2.2

**HSNO Classification:** Not Hazardous

**Hazard Statement:**

Contains gas under pressure; may explode if heated.

**Precautionary Statements:**

Read label before use.  
 Read Safety Data Sheet before use.  
 Protect from sunlight and heat.  
 Store in a well-ventilated place.  
 Wear protective gloves and eye protection.

### COMPOSITION / INGREDIENTS:

| Chemical Entity            | CAS Number | Proportion |
|----------------------------|------------|------------|
| 1,1,1,2- Tetrafluoroethane | 811-97-2   | 100%       |

Contains no other components or impurities that will influence the classification of the product.

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| <b>FIRST AID MEASURES:</b> |
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**Health Effects**

Swallowed: Ingestion is extremely unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal track from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

Eye: Liquid contact can cause severe irritation and frostbite. Mist may also irritate

Skin: Not irritating to the skin. Irritation would result from a defatting action on tissue. Liquid contact can cause frostbite.

Inhaled: R134a is low in acute toxicity in animals. When oxygen levels in air are reduced to 12 – 14% by displacement, symptoms of asphyxiation, loss of co-ordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia can occur.

**First Aid**

Inhalation: In high concentrations may cause headache, nausea and vomiting, which may lead to unconsciousness as well as asphyxiation. Immediately move 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)

Skin: Promptly flush skin with water until the entire chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm water (not hot) If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

Eyes: Immediately flush eyes with large volumes of water for at least 15 minutes. In case of frost bite, water should be lukewarm (not hot) lifting eyelids occasionally to facilitate irrigation.

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.

**Advise 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 clinic conditions.

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| <b>FIRE FIGHTING MEASURES:</b> |
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**Flammability:**  
Non Flammable.

**Fire/Explosion Hazard:**  
R134a is non-flammable at ambient temperatures and atmospheric conditions. However this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Contact with certain reactive metals may result in formation of explosive or exothermic reactions under special conditions (e.g. very high temperatures and /or appropriate pressures.)

**Extinguishing Media:**  
Use appropriate media to extinguish source of surrounding fire. Cool cylinders with water if possible.

**Hazchem Code:** 2 TE

**Recommended Protective Clothing:** Fire fighters should wear self-contained approved Breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be worn at all times.

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| <b>ACCIDENTIAL RELEASE MEASURES:</b> |
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**Personal Protection:**  
Personnel engaged in the movement of cylinders shall be provided with safety footwear, safety glasses and leather or PVC gloves. Full cover overalls are recommended. In areas where equipment failure may cause an immediate high concentration of R134a, ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

**Spills and Disposal:**  
Evacuate unprotected personnel. Product dissipates upon release. Protected personnel should remove ignition sources and shut off leak, if without risk and provide ventilation. Unprotected persons should not return to the affected area until the air has been tested and determined safe, including low lying areas.

**Reference Guide:**  
Standard SNZ HB 76:2008 Dangerous Goods – Initial Emergency Response Guide.  
AS/NZS 1337 – Eye Protection for Industrial Applications  
AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

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AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices  
AS/NZS 1716 – Respiratory Protective Devices

**General:**

Only experienced and properly instructed personnel should handle compressed and liquefied gases. Cylinder contents and identification labels provided by the supplier must not be removed or defaced. Colour coding should not be the only criterion used for content identification.

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| <b>HANDLING AND STORAGE:</b> |
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**Handling**

Flammability: Non Flammable.

**General:**

Only experienced and properly instructed personnel should handle compressed or liquefied gases. Cylinder contents and identification labels provided by the supplier must not be removed or defaced. Colour coding should not be the only criterion used for content identification. Always wear PPE. Avoid breathing vapours and liquid contact with eyes, skin and clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat.

R134a should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

**Approved Handlers:**

Approved handlers are not required, non-hazardous gas (HSNO).

**Storage:**

Storage of compressed gas cylinders shall be in compliance with New Zealand HSNO Regulations.

Cylinders will be kept away from ignition sources (including static discharges).

Cylinders shall be stored in a cool, dry, well-ventilated area out of direct sunlight and away from heat and ignition sources.

No part of cylinders shall be exposed to temperatures above 50°C.

Cylinders shall be stored upright on a level, fireproof floor, secured in position, and protected from damage.

Full cylinders shall be stored separately from empties.

Cylinders should be moved by hand-truck or cart designed for that purpose.

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**Incompatibilities:**

Freshly abraded aluminium surfaces at specific temperatures and pressures may cause a strong exothermic reaction. Chemically reactive metals such as potassium, calcium, powdered aluminium, magnesium and zinc should be avoided.

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| <b>EXPOSURE CONTROLS / PERSONAL PROTECTION:</b> |
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**Exposure Standards:**

TWA 1,000 ppm (8 hrs)

**Engineering Controls:**

Provide adequate local exhaust and dilution (general) ventilation and supply sufficient replacement air to maintain oxygen concentration above 18%.

**Personal Protection:**

Skin contact: may cause frost bite. If prolonged exposure to 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.

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles and or a face shield.

**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 eye wash stations and quick drench shower facilities at convenient locations.

**Reference Guide:**

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

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| <b>PHYSICAL AND CHEMICAL PROPERTIES:</b> |
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**Physical Properties:**

**Appearance:** Clear Colourless liquid and gas with an ethereal and faint sweetish odour.

**Physical State:** Gas at ambient temperatures

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**Chemical Formula:** CH<sub>3</sub>FCF<sub>3</sub>

**Flammability Limits:** Non flammable

**Decomposition Temperature:** <250°C

**Vapour Pressure:** at 21°C = 85.8 psia

**Vapour Density (Air = 1.0):** 3.5

**Solubility in Water (at 0°C):** 0.15 wt%

**Other Properties**

Molecular Weight: 102  
Boiling Point: -26.2°C  
Freezing Point: -92.5°C  
Evaporation Rate: <1

**STABILITY AND REACTIVITY:**

**Flammability:** Non-flammable.

**Normally Stable (Conditions to Avoid):** Do not mix with Oxygen or Air above atmospheric pressure. Any source of high temperature such as lighted cigarettes, flames, hot spots or welding may yield toxic and /or corrosive decomposition products.

**Hazardous Decomposition Products:** Halogens, halogen acids and possibly carbonyl halides.

**TOXICOLOGY INFORMATION:**

In high concentrations causes rapid circulatory insufficiency and Cardiac Sensitization. . Symptoms are headache, nausea and vomiting, which may lead to unconsciousness. Acute effects of rapid evaporation of the liquid may cause frostbite. Vapors are heavier than air and can displace oxygen causing difficulties breathing and or suffocation.

**ECOLOGICAL INFORMATION:**

When discharged in large quantities may contribute to the greenhouse effect.

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### DISPOSAL CONSIDERATIONS:

Do not discharge into any place where its accumulation could be dangerous. Dispatch to atmosphere in large quantities should be avoided. Disposal procedures should comply with relevant discharge regulations.

### TRANSPORT INFORMATION:

**UN Number:** 3159

**Proper Shipping Name:** 1,1,1,2- TETRAFLUORETHANE

**Dangerous Goods Class and Subsidiary Risk:** 2.2

**Packing Group:** Not applicable

**Hazchem Code:** 2TE

**Other Information:**

Avoid transport on vehicles where the load 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 containers are firmly secured.  
Ensure cylinder valve is closed and not leaking.  
Ensure there is adequate ventilation.  
Compliance with applicable regulations.

### REGULATORY INFORMATION:

**Environmental Protection Agency Register Approval No:** HSR001031

**HSNO Controls:**

Hazardous Substances (Compressed Gases) Regulations 2004.  
Hazardous Substances (Tank Wagon and Transportable Containers) Regulations 2004.  
**Approved Handlers:** Approved handlers are not required, non-hazardous gas (HSNO).

### OTHER INFORMATION:

R134a is supplied in disposable gas cylinders.

**References:**

NZS 5433:2007 Transport of Dangerous Goods on Land  
EPA Website – Approvals Register – [www.epa.govt.nz](http://www.epa.govt.nz)

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SNZ HB76:2008 Dangerous Goods – Initial Emergency Response Guide  
 AS1678 2C1 Emergency Procedure Guide – Transport – Non-Flammable, Compressed Gas  
 Operators Handbook for the Transport of Dangerous Goods by Road – NZ Road Transport &  
 Logistics Industry Training Organisation  
 NZCIC Code of Practice – Preparation of Safety Data Sheets

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| <b>MSDS SUMMARY:</b> |
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This MSDS summarises to our best knowledge, at the date of issue, the health and safety hazard information regarding this product and general guidance on how to safely handle the product in the workplace. All due care has been taken to include accurate and up-to-date information in this MSDS.

Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace in conjunction with other products. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact Southern Gas Services Limited.

As far as lawfully possible, no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this MSDS can be accepted.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is available on request.

This MSDS has been prepared in accordance with NZCIC Code of Practice – Preparation of Safety Data Sheets.

This MSDS is subject to change without notice.

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