Material Safety Data Sheet

NON-Hazardous Substance, Dangerous Goods

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**R-134a**
Other name(s):	1,1,1,2-Tetrafluoroethane,, Dymel 134a, Genetron 134a, HFA-134a, HFC-134a, Suva 134a, Norflurane
Recommended Use:	Refrigerant, general analytical/synthetic chemical uses, blowing agent, Aerosol Propellants
Supplier:	PSE Refrigeration & Air Conditioning
ABN:	48 005 815 770
Street Address:	4/5 Kearney St, Bayswater Victoria, Australia, 3153
Telephone Number:	+61 3 9729 8224
Facsimile:	+61 3 9729 3228

2. HAZARDS IDENTIFICATION

This material is non-hazardous according to the criteria of NOHSC; NON-HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) DANGEROUS GOODS.

Risk Phrases:	R59 Dangerous to the ozone layer.
Safety Phrases	S59 Refer to manufacturer/supplier for information on recovery/recycling S61 Avoid release to the environment. Refer to special instructions/safety data sheet
Poisons Schedule:	N/A

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	**CAS Number**	**Proportion**	**Risk Phrases**
1,1,1,2-Tetrafluoroethane	811-97-2	100%	N/A

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (Phone eg. Australia 131 126; New Zealand 0 800 764766) or a doctor.

Inhalation:	Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.
Skin Contact:	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If swelling, redness, blistering or irritation occurs seek medical assistance. For freeze burns, immediately flood burnt area with plenty of warm water (40 - 44 °C) and cover with a clean, dry dressing. Seek immediate medical assistance.
Eye Contact:	If in eyes wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice. For freeze burns, immediately irrigate with copious quantities of warm (40 - 44 °C) water for at least 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre.
Ingestion:	Unlikely to be a route of exposure due to high evaporation rate. However, rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Seek medical advice.
Notes to Physicians	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Hazards from Combustion products	Non Combustible gas.
Precautions for fire fighters and special protective equipment:	Heating can cause expansion or decomposition leading to violent rupture of containers. On decomposing may emit toxic fumes. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.
Suitable Extinguishing Media:	Non Combustible gas. If material is involved in a fire use water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide, dry chemical powder).
Hazchem Code:	2TE

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:	If safe, cut off source of leak. If release is large, cut off all ignition sources and evacuate all non-essential personnel from the area. If possible, ventilate the

	area. If the incident is significant seek immediate assistance from local fire authorities and police. If possible monitor the vapour concentration until dissipated.
Additional information:	**Dangerous Goods – Initial Emergency Response Guide No:** 06

7. HANDLING AND STORAGE

Conditions for safe storage:	Store in a cool, dry, well-ventilated place and out of direct sunlight. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for leaks. This material is classified as a Dangerous Good Class 2.2 Non Flammable, Non Toxic Gas as per the criteria of the Australian Dangerous Goods Code and must be stored in accordance with the relevant regulations.
Precautions for safe handling:	Avoid skin and eye contact and inhalation of vapour

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards	No value assigned for this specific material by Safe Work Australia or Department of Labour New Zealand. However exposure standards for ingredients are Substance — TWA (ppm) — STEL (ppm) 1,1,1,2-Tetrafluoroethane — 1,000 — 4,240 **As published by the National Occupational Health and Safety Commission.*
TWA (Time Weighted Average)	The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.
STEL (Short Term Exposure Limit)	The average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight hour work day.

If the directions for use on the product label are followed, exposure of individuals using the product should not exceed the above standard. The standard was created for workers who are routinely, potentially exposed during product manufacture.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Engineering controls:	Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Use with local exhaust ventilation or while wearing appropriate respirator. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected. Natural ventilation should be adequate under normal use conditions. Keep containers closed when not in use.
Personal Protective Equipment	OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES.

	Wear overalls, safety glasses and impervious gloves. Available information suggests that gloves made from polyvinyl chloride (PVC) should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using. If risk of inhalation of exists, wear organic vapour/particulate respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Gas . Liquid under pressure.
Colour:	Colourless
Odour:	Slightly Ether like
Odour Threshold:	N/A
Molecular Formula:	$C_2H_2F_4$
Solubility in water:	0.9 g/L @ 25^{o}C
General Solubility	Soluble in hydrocarbons, and chlorinated solvents, alcohols, ketones & esters.
Specific Gravity:	N/A
Density	1206 kg/m3 @20^{o}C
Relative Vapour Density (air=1):	4.26 kg/m^3 @20^{o}C
Vapour Pressure (20 °C):	0.665 MPa @20^{o}C
Flash Point (°C):	N/A
Flammability Limits (%):	N/A
% Volatile by Volume:	100
pH:	N/A
Boiling Point/Range (°C):	--26.4
Freezing Point/Range (°C):	-101
Decomposition Temp. (°C):	>370
Autoignition Temp. (°C):	743 (1 bar) 215 (3 bar)
Critical point	4.07 MPa (Pressure) 101 ^{o}C (Temperature)

10. STABILITY AND REACTIVITY

Chemical stability:	This material is thermally stable when stored and used as directed. Thermal Decomposition occurs at >370^{o}C
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame.
Incompatible materials:	Oxidising agents.
Hazardous	Oxides of carbon and nitrogen, smoke and other toxic fumes, including HF

decomposition products:	(hydrogen fluoride)
Hazardous reactions:	No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion:	Unlikely route of exposure. Swallowing can result in nausea, vomiting and irritation of the gastrointestinal tract.
Eye contact:	May be an eye irritant. Liquid splashes or spray may cause freeze burns to the eye.
Skin contact:	Liquid splashes or spray may cause freeze burns. Contact with skin may result in irritation.
Inhalation:	Material may be irritant to mucous membranes and respiratory tract.
Long Term Effects:	No information available for product.
Toxicological Data:	No LD50 data available for the product.

12. ECOLOGICAL INFORMATION

Ecotoxicity	No information available. Avoid contaminating waterways.
Persistence/degradability and mobility	No information available.
Aquatic toxicity:	No information available.
Terrestrial toxicity:	No information available.

13. DISPOSAL CONSIDERATIONS

Disposal methods:	Refer to Waste Management Authority & Local/State EPA guidelines. Close valves of empty containers. Return empty containers to supplier using the same precautions as with filled containers.

14. TRANSPORT INFORMATION

Road and Rail Transport:

Classified as Dangerous Goods by the criteria of the "Australian Code for the Transport of Dangerous Goods by Road & Rail" and the "New Zealand NZS5433: Transport of Dangerous Goods on Land".

UN No:	3159
Class-primary:	2.2
Subrisk 1:	N/A
Proper Shipping Name:	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)
Hazchem Code:	2TE
Segregation Dangerous Goods	Not to be loaded with explosives (Class 1), spontaneously combustible substances (Class 4.2) or organic peroxides (Class 5.2), however exemptions may apply.

Marine Transport:

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

UN No:	3159
Class-primary:	2.2
Subrisk 1:	N/A
Proper Shipping Name:	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

Air Transport:

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No:	3159
Class-primary:	2.2
Subrisk 1:	N/A
Proper Shipping Name:	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

15. REGULATORY INFORMATION

Poisons Schedule:	Not Scheduled.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Date of Issue	30/01/2012