Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: **KLEA 134A**

Other name(s): Tetrafluoroethane; 1,1,1,2-Tetrafluoroethane; Fluorocarbon 134A; Arcton 134A; R134A; HFC 134A; HFA 134A.

Recommended Use of the Chemical and Restrictions on Use Refrigerant, foam blowing agent, aerosol propellant.

Supplier: Ixom Operations Pty Ltd
ABN: 51 600 546 512
Street Address: Level 8, 1 Nicholson Street
East Melbourne Victoria 3002
Australia

Telephone Number: +61 3 9906 3000
Emergency Telephone: **1 800 033 111 (ALL HOURS)**

Please ensure you refer to the limitations of this Safety Data Sheet as set out in the "Other Information" section at the end of this Data Sheet.

2. HAZARDS IDENTIFICATION

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:
Gases under pressure - Liquefied Gas

SIGNAL WORD: WARNING

Hazard Statement(s):
H280 Contains gas under pressure; may explode if heated.

Response:
No response statements.

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

Disposal:
No disposal statements.

Other Hazards:
Asphyxiant. Effects are proportional to oxygen displacement.
May displace oxygen and cause rapid suffocation.

Poisons Schedule (SUSMP): None allocated.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Hazard Codes
1,1,1,2-Tetrafluoroethane	811-97-2	100%	H280

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor.

Inhalation:
Remove victim from area of 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. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

Skin Contact:
For freeze burns, immediately flood burnt area with large amounts of luke-warm water and cover with a clean, dry dressing. Do not use hot water. Seek immediate medical assistance.

Eye Contact:
Immediately wash in and around the eye area with large amounts of water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport promptly to hospital or medical centre.

Ingestion:
Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

Indication of immediate medical attention and special treatment needed:
Treat symptomatically. Adrenaline and similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:
Not combustible, however, if material is involved in a fire use: Extinguishing media appropriate to surrounding fire conditions. Allow gas fires to burn until exhausted.

Hazchem or Emergency Action Code: 2TE

Specific hazards arising from the chemical:
Non-flammable, non-toxic gas. Gas/vapour is heavier than air; may accumulate in confined spaces.

Special protective equipment and precautions for fire-fighters:
Decomposes on heating emitting toxic fumes, including those of hydrogen fluoride . Certain mixtures of this refrigerant and air when under pressure may be flammable. Keep containers cool with water spray. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. If safe to do so, remove containers from path of fire.

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures/Environmental precautions:
Clear area of all unprotected personnel. Vapour may create a suffocating atmosphere. Increase ventilation. If contamination of sewers or waterways has occurred advise local emergency services.

Personal precautions/Protective equipment/Methods and materials for containment and cleaning up:
If safe to do so, isolate the leak. Small spills are allowed to evaporate provided there is adequate ventilation. Avoid breathing in vapours. Work up wind or increase ventilation. Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material).

7. HANDLING AND STORAGE

Precautions for safe handling:
Avoid skin and eye contact and breathing in vapour. Take precautionary measures against static discharges. Do not heat up.

Conditions for safe storage, including any incompatibilities:
Store in a cool, dry, well ventilated place. Store below 52°C. Store away from sources of heat or ignition. Store away from incompatible materials described in Section 10. Avoid storing near to the intake of air conditioning units, boiler units and open drains. Keep containers closed when not in use - check regularly for leaks.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

1,1,1,2-Tetrafluoroethane (HFC 134a): 8hr TWA = 4240 mg/m^3 (1000 ppm)

As published by Safe Work Australia Workplace Exposure Standards for Airborne Contaminants.

TWA - The time-weighted average airborne concentration of a particular substance when calculated over an eight-hour working day, for a five-day working week.

These Workplace 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 workplace 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.

Appropriate engineering controls:
Ensure ventilation is adequate to maintain air concentrations below Workplace Exposure Standards. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected. Keep containers closed when not in use.

If in the handling and application of this material, safe exposure levels could be exceeded, the use of engineering controls such as local exhaust ventilation must be considered and the results documented. If achieving safe exposure levels does not require engineering controls, then a detailed and documented risk assessment using the relevant Personal Protective Equipment (PPE) (refer to PPE section below) as a basis must be carried out to determine the minimum PPE requirements.

Individual protection measures, such as Personal Protective Equipment (PPE):
The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES.

Wear overalls, chemical goggles and impervious gloves. If determined by a risk assessment an inhalation risk exists, wear an air supplied respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716.
Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquefied gas
Colour:	Colourless
Odour:	Odourless
Molecular Formula:	CF3CH2F
Solubility:	Slightly soluble in water.
Specific Gravity:	1.22 @20°C
Relative Vapour Density (air=1):	3.6
Vapour Pressure (20 °C):	4270 mm Hg
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	>743
Boiling Point/Range (°C):	-26.2
Decomposition Point (°C):	Not available
pH:	Not available
Freezing Point/Range (°C):	-108

10. STABILITY AND REACTIVITY

Reactivity:	Can react violently if in contact with alkali metals and alkaline earth metals.
Chemical stability:	Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Possibility of hazardous reactions:	Can react violently if in contact with alkali metals and alkaline earth metals such as sodium, potassium, or barium.
Conditions to avoid:	Avoid exposure to heat. Avoid high temperatures.
Incompatible materials:	Incompatible with finely powdered metals , magnesium and alloys containing more than 2% magnesium , alkali metals , alkaline earth metals such as sodium , potassium , or barium .
Hazardous decomposition products:	Hydrogen fluoride. Oxides of carbon.

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: Not a likely route of exposure, however, swallowing liquid will result in freeze burns of the mouth, throat and stomach.

Eye contact: Liquid splashes or spray may cause freeze burns to the eye.

Skin contact: Liquid splashes or spray may cause freeze burns. May cause frostbite.

Inhalation: Material may be irritant to the mucous membranes of the respiratory tract (airways). Breathing in vapour can result in headaches, dizziness, drowsiness, and possible nausea. Breathing in high concentrations can produce central nervous system depression, which can lead to loss of co-ordination, impaired judgement and if exposure is prolonged, unconsciousness. Breathing in high concentrations may result in an irregular heart beat and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.

Acute toxicity:
Inhalation LC50 (rat): 567,000 ppm/4hr

Respiratory or skin sensitisation: Not a skin sensitiser.

Chronic effects: A lifetime inhalation study in rats has shown that exposure to 50000 ppm resulted in benign tumours of the testis. The increased tumour incidence was observed only after prolonged exposure to high levels, and is considered not to be of relevance to humans occupationally exposed to HFC 134a at or below the occupational exposure limit.

Carcinogenicity: Not listed as carcinogenic according to the International Agency for Research on Cancer (IARC).

Aspiration hazard: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Persistence/degradability: The material is not readily biodegradable.

Bioaccumulative potential: This product shows a low bioaccumulation potential.

Mobility in soil: Expected to be mobile in soil.

Log Octanol/Water Partition Coefficient: log Kow = 1.06

96hr LC50 (rainbow trout): 450 mg/L

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Best practice is to recover and recycle. Otherwise refer to Land Authority for an approved facility which is equipped to absorb and neutralise waste substances.

14. TRANSPORT INFORMATION

Road and Rail Transport
Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

UN No:	3159
Transport Hazard Class:	2.2 Non-Flammable Non-Toxic Gas
Proper Shipping Name or Technical Name:	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)
Hazchem or Emergency Action Code:	2TE

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
Transport Hazard Class:	2.2 Non-Flammable Non-Toxic Gas
Proper Shipping Name or Technical Name:	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)
IMDG EMS Fire:	F-C
IMDG EMS Spill:	S-V

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. TRANSPORT PROHIBITED under the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air in Passenger and Cargo Aircraft; may be transported by Cargo Aircraft Only.

UN No:	3159
Transport Hazard Class:	2.2 Non-Flammable Non-Toxic Gas
Proper Shipping Name or Technical Name:	1,1,1,2-TETRAFLUOROETHANE

15. REGULATORY INFORMATION

Classification:
This material is hazardous according to Safe Work Australia; HAZARDOUS CHEMICAL.

Classification of the chemical:
Gases under pressure - Liquefied Gas

Hazard Statement(s):
H280 Contains gas under pressure; may explode if heated.

Poisons Schedule (SUSMP): None allocated.

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

16. OTHER INFORMATION

Supplier Safety Data Sheet; 01/ 2017.
'ARCTON' and 'KLEA' are trademarks of INEOS Fluor Holdings Limited.

This safety data sheet has been prepared by Ixom Operations Pty Ltd Toxicology & SDS Services.

Reason(s) for Issue:
5 Yearly Revised Primary SDS

This SDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Ixom Operations Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Ixom representative or Ixom Operations Pty Ltd at the contact details on page 1.

Ixom Operations Pty Ltd's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.