

Chemwatch Material Safety Data Sheet
Issue Date: 1-Mar-2011
XC9317SC

Hazard Alert Code: MODERATE

CHEMWATCH 25-9322
Version No:2.0
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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

A-Gas R437A

SYNONYMS

"Isceon MO 49 Plus"

PROPER SHIPPING NAME

REFRIGERANT GAS, N.O.S.(contains tetrafluoroethane and pentafluoroethane)

PRODUCT USE

■ The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.
Refrigerant.

SUPPLIER

Company: A- Gas (Australia) Pty Ltd

Address:

9- 11 Oxford Road

Laverton North

VIC, 3026

Australia

Telephone: +61 3 9368 9222

Emergency Tel:TOLL: [+61] 1800 024 973

Fax: +61 3 9368 9233

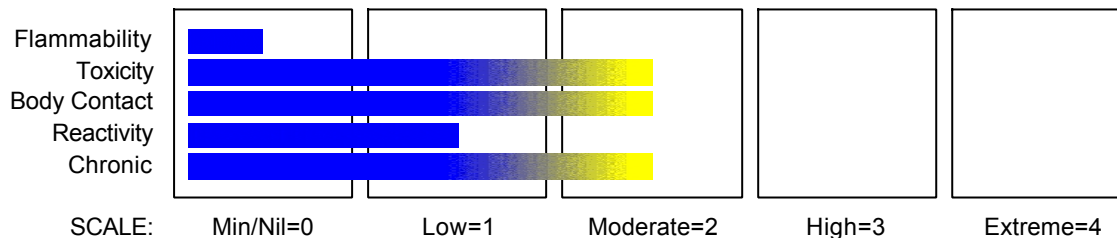
Website: www.agas.com

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

DANGEROUS GOODS. NON-HAZARDOUS SUBSTANCE. According to NOHSC Criteria, and ADG Code.

CHEMWATCH HAZARD RATINGS



RISK

- Forms very sensitive explosive metallic compounds.
- In use, may form flammable/ explosive vapour- air mixture.

SAFETY

- Do not breathe gas/fumes/vapour/spray.
- Avoid contact with skin.

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Section 2 - HAZARDS IDENTIFICATION

- Risk of explosion if heated under confinement.
 - Dangerous for the ozone layer.
 - Inhalation may produce health damage*.
 - Cumulative effects may result following exposure*.
 - May produce discomfort of the respiratory system and skin*.
 - Repeated exposure potentially causes skin dryness and cracking*.
 - Vapours potentially cause drowsiness and dizziness*.
- *(limited evidence).
- Wear suitable gloves.
 - Use only in well ventilated areas.
 - Keep container in a well ventilated place.
 - Do not empty into drains.
 - To clean the floor and all objects contaminated by this material, use water and detergent.
 - Keep container tightly closed.
 - This material and its container must be disposed of in a safe way.
 - Use appropriate container to avoid environmental contamination.
 - Refer to manufacturer/supplier for information on recovery/recycling.
 - Avoid release to the environment. Refer to special instructions/Safety data sheets.
 - This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
tetrafluoroethane	811-97-2	75-85
pentafluoroethane	354-33-6	15-25
butane	106-97-8	1-2
n- pentane	109-66-0	0-1
chloropentafluoroethane	76-15-3	<0.5

Section 4 - FIRST AID MEASURES

SWALLOWED

- Not considered a normal route of entry.
- Avoid giving milk or oils.
- Avoid giving alcohol.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

EYE

- If product comes in contact with eyes remove the patient from gas source or contaminated area.
- Take the patient to the nearest eye wash, shower or other source of clean water.
- Open the eyelid(s) wide to allow the material to evaporate.
- Gently rinse the affected eye(s) with clean, cool water for at least 15 minutes. Have the patient lie or sit down and tilt the head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners.

SKIN

- If skin contact occurs:
 - Immediately remove all contaminated clothing, including footwear.
 - Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.
- In case of cold burns (frost-bite):
 - Move casualty into warmth before thawing the affected part; if feet are affected carry if possible
 - Bathe the affected area immediately in luke-warm water (not more than 35 deg C) for 10 to 15 minutes, immersing if possible and without rubbing
 - DO NOT apply hot water or radiant heat.
 - Apply a clean, dry, light dressing of "fluffed-up" dry gauze bandage.

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Section 4 - FIRST AID MEASURES

INHALED

- Following exposure to gas, remove the patient from the gas source or contaminated area.
- NOTE: Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer.
- Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures.
- If the patient is not breathing spontaneously, administer rescue breathing.

NOTES TO PHYSICIAN

- for intoxication due to Freons/ Halons;
A: Emergency and Supportive Measures
- Maintain an open airway and assist ventilation if necessary
- Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- Monitor the ECG for 4-6 hours
- B: Specific drugs and antidotes:
 - There is no specific antidote.
- For frost-bite caused by liquefied petroleum gas:
 - If part has not thawed, place in warm water bath (41-46 C) for 15-20 minutes, until the skin turns pink or red.
 - Analgesia may be necessary while thawing.
 - If there has been a massive exposure, the general body temperature must be depressed, and the patient must be immediately rewarmed by whole-body immersion, in a bath at the above temperature.
 - Shock may occur during rewarming.

for gas exposures:

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for pulmonary oedema .

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- SMALL FIRE: Use extinguishing agent suitable for type of surrounding fire.
- LARGE FIRE: Cool cylinder.
- DO NOT direct water at source of leak or venting safety devices as icing may occur.

FIRE FIGHTING

GENERAL

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus and protective gloves.
- Fight fire from a safe distance, with adequate cover.
- Use water delivered as a fine spray to control fire and cool adjacent area.

FIRE/EXPLOSION HAZARD

- WARNING: In use may form flammable/ explosive vapour-air mixtures.
- Containers may explode when heated - Ruptured cylinders may rocket
- Fire exposed containers may vent contents through pressure relief devices.
- High concentrations of gas may cause asphyxiation without warning.
- May decompose explosively when heated or involved in fire.
- Decomposition may produce toxic fumes of: carbon monoxide (CO).
- Combustion products include: carbon dioxide (CO₂), hydrogen fluoride, other pyrolysis products typical of burning organic material.
- Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

FIRE INCOMPATIBILITY

- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

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Section 5 - FIRE FIGHTING MEASURES

HAZCHEM

2TE

Personal Protective Equipment

Breathing apparatus.

Gas tight chemical resistant suit.

Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Environmental hazard - contain spillage.
- Avoid breathing vapour and any contact with liquid or gas. Protective equipment including respirator should be used.
- DO NOT enter confined spaces where gas may have accumulated.
- Increase ventilation.
- Clear area of personnel.

MAJOR SPILLS

- Environmental hazard - contain spillage.
- Clear area of all unprotected personnel and move upwind.
- Alert Emergency Authority and advise them of the location and nature of hazard.
- Wear breathing apparatus and protective gloves.
- Prevent by any means available, spillage from entering drains and water-courses.
- Remove leaking cylinders to a safe place.
- Fit vent pipes. Release pressure under safe, controlled conditions
- Burn issuing gas at vent pipes.
- DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Electrostatic discharge may be generated during pumping - this may result in fire.
- Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/sec until fill pipe submerged to twice its diameter, then ≤ 7 m/sec).
- Avoid splash filling.
- Consider use in closed pressurised systems, fitted with temperature, pressure and safety relief valves which are vented for safe dispersal.
- The tubing network design connecting gas cylinders to the delivery system should include appropriate pressure indicators and vacuum or suction lines.
- Fully-welded types of pressure gauges, where the bourdon tube sensing element is welded to the gauge body, are recommended.
- Before connecting gas cylinders, ensure manifold is mechanically secure and does not contain another gas. Before disconnecting gas cylinder, isolate supply line segment proximal to cylinder, remove trapped gas in supply line with aid of vacuum pump.
- DO NOT transfer gas from one cylinder to another.

SUITABLE CONTAINER

- DO NOT use aluminium or galvanised containers.
- Cylinder:
 - Ensure the use of equipment rated for cylinder pressure.
 - Ensure the use of compatible materials of construction.
 - Valve protection cap to be in place until cylinder is secured, connected.

STORAGE INCOMPATIBILITY

- As a general rule, hydrofluorocarbons tend to be flammable unless they contain more fluorine atoms than hydrogen atoms.
Haloalkanes:
 - are highly reactive: some of the more lightly substituted lower members are highly flammable; the more highly substituted may be used as fire suppressants, not always with the anticipated results.

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Section 7 - HANDLING AND STORAGE

- may react with the lighter divalent metals to produce more reactive compounds analogous to Grignard reagents.
- may produce explosive compounds following prolonged contact with metallic or other azides
- may react on contact with potassium or its alloys - although apparently stable on contact with a wide range of halocarbons, reaction products may be shock-sensitive and may explode with great violence on light impact; severity generally increases with the degree of halocarbon substitution and potassium-sodium alloys give extremely sensitive mixtures .
- Compressed gases may contain a large amount of kinetic energy over and above that potentially available from the energy of reaction produced by the gas in chemical reaction with other substances.

STORAGE REQUIREMENTS

- Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open.
- Such compounds should be sited and built in accordance with statutory requirements.
- The storage compound should be kept clear and access restricted to authorised personnel only.
- Cylinders stored in the open should be protected against rust and extremes of weather.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	Notes
Australia Exposure Standards	tetrafluoroethane (1, 1, 1, 2-Tetrafluoroethane)	1000	4240						
Australia Exposure Standards	n- pentane (Pentane)	600	1770	750	2210				
Australia Exposure Standards	chloropentafluoro ethane (Chloropentafluoroethane)	1000	6320						

The following materials had no OELs on our records

- pentafluoroethane: CAS:354- 33- 6

PERSONAL PROTECTION



RESPIRATOR

- Type GAX Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET

- When handling sealed and suitably insulated cylinders wear cloth or leather gloves.
- Insulated gloves:

NOTE: Insulated gloves should be loose fitting so that may be removed quickly if liquid is spilled upon them.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

OTHER

- Protective overalls, closely fitted at neck and wrist.
- Eye-wash unit.
- Ensure availability of lifeline in confined spaces.
- Staff should be trained in all aspects of rescue work.

ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Colourless clear compressed liquefied gas with a slight ether-like odour; does not mix with water.

PHYSICAL PROPERTIES

Gas.

Does not mix with water.

Sinks in water.

State	Liquefied Gas	Molecular Weight	Not Applicable
Melting Range (°C)	Not Available	Viscosity	Not Applicable
Boiling Range (°C)	- 32 to - 29	Solubility in water (g/L)	Immiscible
Flash Point (°C)	Not Applicable	pH (1% solution)	Not Applicable
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not Applicable
Autoignition Temp (°C)	Not Available	Vapour Pressure (kPa)	Not Applicable
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	1.192 (as liquid)
Lower Explosive Limit (%)	Not Available	Relative Vapour Density (air=1)	Not Available
Volatile Component (%vol)	Not Available	Evaporation Rate	Not Available
butane			
log Kow (Sangster 1997):		2.89	
n- pentane			
log Kow (Sangster 1997):		3.39	

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

- Vapours may cause dizziness or suffocation.
- Inhalation may produce health damage*.

CHRONIC HEALTH EFFECTS

- Cumulative effects may result following exposure*.
- Repeated exposure potentially causes skin dryness and cracking*.

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Section 11 - TOXICOLOGICAL INFORMATION

- May produce discomfort of the respiratory system and skin*.
- Vapours potentially cause drowsiness and dizziness*.
- * (limited evidence).
- * (limited evidence).

TOXICITY AND IRRITATION

- Not available. Refer to individual constituents.

Section 12 - ECOLOGICAL INFORMATION

Dangerous for the ozone layer.
This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
A- Gas R437A	No Data Available	No Data Available		
tetrafluoroethane	HIGH	No Data Available	LOW	HIGH
pentafluoroethane	HIGH	No Data Available	LOW	MED
butane	LOW	No Data Available	LOW	HIGH
n- pentane	HIGH	No Data Available	LOW	HIGH
chloropentafluoroethane	HIGH	No Data Available	LOW	MED

Section 13 - DISPOSAL CONSIDERATIONS

- Evaporate residue at an approved site.
- Return empty containers to supplier. If containers are marked non-returnable establish means of disposal with manufacturer prior to purchase.
- Ensure damaged or non-returnable cylinders are gas-free before disposal.

Section 14 - TRANSPORTATION INFORMATION



Labels Required: NON-FLAMMABLE COMPRESSED GAS

HAZCHEM:
2TE (ADG7)

Land Transport UNDG:

Class or division:	2.2	Subsidiary risk:	None
UN No.:	1078	UN packing group:	None
Shipping Name: REFRIGERANT GAS, N.O.S. (contains tetrafluoroethane and pentafluoroethane)			

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Section 14 - TRANSPORTATION INFORMATION

Air Transport IATA:

UN/ID Number:	1078	Packing Group:	-
Special provisions:	None		
Cargo Only			
Packing Instructions:	200	Maximum Qty/Pack:	150 kg
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	Forbidden	Maximum Qty/Pack:	75 kg
Passenger and Cargo Limited Quantity		Passenger and Cargo Limited Quantity	
Packing Instructions:	200	Maximum Qty/Pack:	Forbidden

Shipping Name: REFRIGERANT GAS, N.O.S. *(CONTAINS TETRAFLUOROETHANE AND PENTAFLUOROETHANE)

Maritime Transport IMDG:

IMDG Class:	2.2	IMDG Subrisk:	None
UN Number:	1078	Packing Group:	None
EMS Number:	F-C,S-V	Special provisions:	274
Limited Quantities:	120 ml		

Shipping Name: REFRIGERANT GAS, N.O.S.(contains tetrafluoroethane and pentafluoroethane)

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE None

REGULATIONS

Regulations for ingredients

tetrafluoroethane (CAS: 811-97-2) is found on the following regulatory lists;

"Australia Exposure Standards", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "Australia Inventory of Chemical Substances (AICS)"

pentafluoroethane (CAS: 354-33-6) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)", "International Council of Chemical Associations (ICCA) - High Production Volume List"

butane (CAS: 106-97-8) is found on the following regulatory lists;

"Australia High Volume Industrial Chemical List (HVICL)"

n-pentane (CAS: 109-66-0) is found on the following regulatory lists;

"Australia Exposure Standards", "Australia High Volume Industrial Chemical List (HVICL)", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Fragrance Association (IFRA) Survey: Transparency List"

chloropentafluoroethane (CAS: 76-15-3) is found on the following regulatory lists;

"Australia Exposure Standards", "Australia Hazardous Substances", "Australia Inventory of Chemical Substances (AICS)"

No data for A-Gas R437A (CW: 25-9322)

Section 16 - OTHER INFORMATION

Denmark Advisory list for selfclassification of dangerous substances

Substance	CAS	Suggested codes
tetrafluoroethane	811- 97- 2	T; R25
chloropentafluoroethane	76- 15- 3	R52/53

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether

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Section 16 - OTHER INFORMATION

the reported Hazards are Risks in the workplace or other settings.

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Issue Date: 1-Mar-2011

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This is the end of the MSDS.