

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

Hazard Alert Code: MODERATE

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 1 of 9

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

A-Gas R134a

PROPER SHIPPING NAME

1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

PRODUCT USE

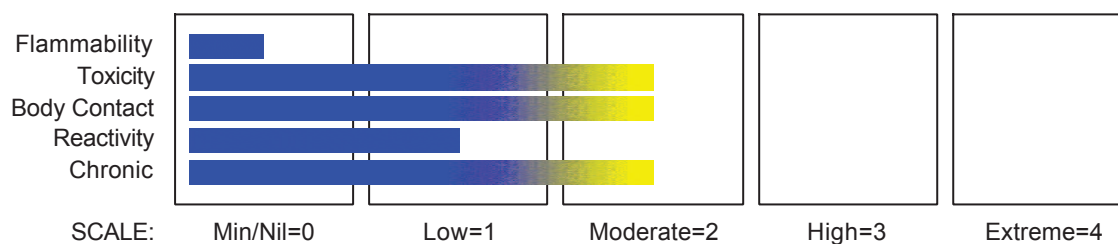
Wide use in household and commercial refrigeration and automotive air-conditioning.

SUPPLIER

Company: A- Gas (Australia) Pty Ltd
Address:
9- 11 Oxford Road
Laverton North
VIC 3026
Australia
Telephone: [61] (0) 3 93689222
Emergency Tel: **TOLL: [61] 1800 024 973**
Fax: [61] (0) 3 93689233

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS



GHS Classification

Gas under Pressure (Liquefied gas)
STOT - SE (Narcosis) Category 3
STOT - SE (Resp. Irr.) Category 3



EMERGENCY OVERVIEW

HAZARD WARNING

Determined by Chemwatch using GHS criteria
H280 Contains gas under pressure; may explode if heated.
H335 May cause respiratory irritation.

continued...

A-Gas R134a

Hazard Alert Code: MODERATE

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 2 of 9

Section 2 - HAZARDS IDENTIFICATION

H336 May cause drowsiness or dizziness.
AUH044 Risk of explosion if heated under confinement

PRECAUTIONARY STATEMENTS

Prevention

Code	Phrase
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271	Use only outdoors or in a well- ventilated area.

Response

Code	Phrase
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.

Storage

Code	Phrase
P403+P233	Store in a well- ventilated place. Keep container tightly closed.
P405	Store locked up.
P410+P403	Protect from sunlight. Store in a well- ventilated place.

Disposal

Code	Phrase
P501	Dispose of contents/container to ...

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
tetrafluoroethane	811-97-2	>99.5

Section 4 - FIRST AID MEASURES

SWALLOWED

- Not considered a normal route of entry.
- Avoid giving milk or oils.
- Avoid giving alcohol.

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.

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

continued...

A-Gas R134a

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

Hazard Alert Code: MODERATE

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 3 of 9

Section 4 - FIRST AID MEASURES

- 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 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

- 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), carbon dioxide (CO₂), hydrogen fluoride.
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.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- 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

- 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.

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

continued...

A-Gas R134a

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

Hazard Alert Code: MODERATE

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 4 of 9

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Vented gas is more dense than air and may collect in pits, basements.
- 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

Cylinder: Steel packaging

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.

Cylinder must be properly secured either in use or in storage.

Cylinder valve must be closed when not in use or when empty.

Segregate full from empty cylinders.

WARNING: Suckback into cylinder may result in rupture. Use back-flow preventive device in piping.

STORAGE INCOMPATIBILITY

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.
- 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.
- Avoid reaction with oxidising agents.

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	(1, 1, 1, 2- Tetrafluoroethan e)	1000	4240						

MATERIAL DATA

A-GAS R134A:

Not available

TETRAFLUOROETHANE:

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations.

May act as simple asphyxiants; these are gases which, when present in high concentrations, reduce the oxygen content in air

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A-Gas R134a

Hazard Alert Code: MODERATE

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 5 of 9

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

below that required to support breathing, consciousness and life; loss of consciousness, with death by suffocation may rapidly occur in an oxygen deficient atmosphere.

CARE: Most simple asphyxiants are odourless or possess low odour and there is no warning on entry into an oxygen deficient atmosphere.

Studies show that HFC 134a is practically nontoxic by inhalation. The acute lethal effects occur at levels exceeding 50000 ppm whilst the threshold for cardiac sensitisation occurs at about 75000 ppm. Repeated exposures at 50000 ppm for 13 weeks did not produce significant toxicity in animals. Limited studies have shown the substance not to be a carcinogen, or to exhibit mutagenic effects. Exposures up to 300000 ppm and 40000 ppm did not produce teratogenic effects in rats and rabbits respectively. The workplace environmental exposure level (WEEL), recommended by the AIHA, is thought to be protective against cardiac sensitisation and systemic injury.

PERSONAL PROTECTION



RESPIRATOR

• Type AX 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.

OTHER

- Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)
- Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.
- 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 pressurised liquefied gas with a mild ethereal odour; does not mix with water.

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A-Gas R134a

Hazard Alert Code: MODERATE

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 6 of 9

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Gas.			
Does not mix with water.			
Sinks in water.			
State	Liquified Gas	Molecular Weight	102.03
Melting Range (°C)	- 101 (freezing)	Viscosity	0.21 cSt@ 25 deg.°C
Boiling Range (°C)	- 26.3	Solubility in water (g/L)	Immiscible
Flash Point (°C)	Not Applicable	pH (1% solution)	Not Available
Decomposition Temp (°C)	Not Available	pH (as supplied)	7
Autoignition Temp (°C)	Not Applicable	Vapour Pressure (kPa)	572 @ 20 deg.C
Upper Explosive Limit (%)	Not Applicable	Specific Gravity (water=1)	1.21 @ 25 deg.C
Lower Explosive Limit (%)	Not Applicable	Relative Vapour Density (air=1)	4.32 @ 20 deg.C
Volatile Component (%vol)	100	Evaporation Rate	Not Available

Section 10 - CHEMICAL STABILITY

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

Health hazard summary table:

Acute toxicity	Not applicable
Skin corrosion/irritation	Not applicable
Serious eye damage/irritation	Not applicable
Respiratory or skin sensitization	Not applicable
Germ cell mutagenicity	Not applicable
Carcinogenicity	Not applicable
Reproductive toxicity	Not applicable
STOT- single exposure	STOT SE 3
	STOT SE 3
STOT- repeated exposure	Not applicable
Aspiration hazard	Not applicable

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- Not normally a hazard due to physical form of product.

EYE

- Vapourising liquid causes rapid cooling and contact may cause cold burns, frostbite, even through normal gloves. Frozen skin tissues are painless and appear waxy and yellow.

SKIN

- Fluorocarbons remove natural oils from the skin, causing irritation, dryness and sensitivity.
- Vapourising liquid causes rapid cooling and contact may cause cold burns, frostbite, even through normal gloves. Frozen skin tissues are painless and appear waxy and yellow.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

- Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

continued...

A-Gas R134a

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

Hazard Alert Code: MODERATE

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 7 of 9

Section 11 - TOXICOLOGICAL INFORMATION

- Inhalation of non-toxic gases may cause:• CNS effects: headache, confusion, dizziness, stupor, seizures and coma;• respiratory: shortness of breath and rapid breathing;• cardiovascular: collapse and irregular heart beats;• gastrointestinal: mucous membrane irritation, nausea and vomiting.
- The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant.
- Exposure to fluorocarbons can produce non-specific flu-like symptoms such as chills, fever, weakness, muscle pain, headache, chest discomfort, sore throat and dry cough with rapid recovery. High concentrations can cause irregular heartbeats and a stepwise reduction in lung capacity.
- Acute intoxication by halogenated aliphatic hydrocarbons appears to take place over two stages. Signs of a reversible narcosis are evident in the first stage and in the second stage signs of injury to organs may become evident, a single organ alone is (almost) never involved.

CHRONIC HEALTH EFFECTS

Principal route of occupational exposure to the gas is by inhalation.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Fluorocarbons can cause an increased risk of cancer, spontaneous abortion and birth defects.

TOXICITY AND IRRITATION

No data for this material.

Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
tetrafluoroethane	HIGH	No Data Available	LOW	HIGH

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)

ADG7:

Class or Division:	2.2	Subsidiary Risk:	None
UN No.:	3159	Packing Group:	None

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A-Gas R134a

Hazard Alert Code: MODERATE

Chemwatch GHS Safety Data Sheet

Issue Date: 25-Jan-2013

XC554SP

CHEMWATCH 7568-17

Version No:8.1.1.1

Page 8 of 9

Section 14 - TRANSPORTATION INFORMATION

Special Provision:	None	Limited Quantity:	120 ml
Portable Tanks & Bulk Containers - Instruction:	T50	Portable Tanks & Bulk Containers - Special Provision:	None
Packagings & IBCs - Packing Instruction:	P200	Packagings & IBCs - Special Packing Provision:	None
Name and Description: 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)			

Air Transport IATA:

ICAO/IATA Class:	2.2	ICAO/IATA Subrisk:	None
UN/ID Number:	3159	Packing Group:	-
Special provisions: Cargo Only	None		
Packing Instructions: Passenger and Cargo	200	Maximum Qty/Pack: Passenger and Cargo	150 kg
Packing Instructions: Passenger and Cargo Limited Quantity	200	Maximum Qty/Pack: Passenger and Cargo Limited Quantity	75 kg
Packing Instructions:	Forbidden	Maximum Qty/Pack:	Forbidden

Shipping name:1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

Maritime Transport IMDG:

IMDG Class:	2.2	IMDG Subrisk:	None
UN Number:	3159	Packing Group:	None
EMS Number:	F-C,S-V	Special provisions:	None
Limited Quantities:	120 ml		
Shipping name:1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)			

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE None

REGULATIONS

Regulations for ingredients

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

"Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (AQUA/1 to 6 - non-pesticide anthropogenic organics)", "Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Aquatic habitat)", "Australia Customs (Prohibited Exports) Regulations 1958 - Schedule 15 Ozone depleting substances - Part 9 HFCs", "Australia Exposure Standards", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "Australia Inventory of Chemical Substances (AICS)", "OECD List of High Production Volume (HPV) Chemicals", "Sigma-AldrichTransport Information"

No data for A-Gas R134a (CW: 7568-17)

Section 16 - OTHER INFORMATION

Denmark Advisory list for selfclassification of dangerous substances

Substance	CAS	Suggested codes
tetrafluoroethane	811- 97- 2	T; R25

■ 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

continued...

A-Gas R134a

Chemwatch GHS Safety Data Sheet
Issue Date: 25-Jan-2013
XC554SP

Hazard Alert Code: MODERATE

CHEMWATCH 7568-17
Version No:8.1.1.1
Page 9 of 9

Section 16 - OTHER INFORMATION

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

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