A-Gas R406A

A-Gas (Singapore) PTE LTD

Chemwatch Hazard Alert Code: **2**

Chemwatch: **8195-81**
Version No: **5.1.1.1**
Material Safety Data Sheet according to NOHSC and ADG requirements

Issue Date: **09/09/2013**
Print Date: **07/03/2014**
Initial Date: **Not Available**
S.Local.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	A-Gas R406A
Chemical Name	Not Applicable
Synonyms	Not Available
Proper shipping name	REFRIGERANT GAS, N.O.S.
Chemical formula	Not Applicable
Other means of identification	Not Available
CAS number	Not Applicable

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Refrigerant. Used according to manufacturer's directions. Intermediate.

Details of the supplier of the safety data sheet

Registered company name	A-Gas (Singapore) PTE LTD
Address	360 Orchard Road, #10-05, Int'l Building 238869 Singapore
Telephone	65 6836 0065
Fax	65 6836 6521
Website	www.agas.com
Email	Not Available

Emergency telephone number

Association / Organisation	Not Available
Emergency telephone numbers	65 6836 0065
Other emergency telephone numbers	65 6836 0065

CHEMWATCH EMERGENCY RESPONSE

Primary Number	Alternative Number 1	Alternative Number 2
1800 039 008	+612 9186 1132	Not Available

Once connected and if the message is not in your prefered language then please dial 01

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

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

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	2	
Body Contact	2	
Reactivity	1	
Chronic	2	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	None	
Risk Phrases [1]	**R52/53**	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	R44	Risk of explosion if heated under confinement.
	R59	Dangerous for the ozone layer.
	R04	Forms very sensitive explosive metallic compounds.

Continued...

Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI*
GHS Classification [1]	Chronic Aquatic Hazard Category 3, Hazardous to the Ozone Layer Category 1
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI*

Label elements

GHS label elements	
SIGNAL WORD	**WARNING**

Hazard statement(s)

H412	Harmful to aquatic life with long lasting effects
H420	Harms public health and the environment by destroying ozone in the upper atmosphere
AUH044	Risk of explosion if heated under confinement

Precautionary statement(s): Prevention

P273	Avoid release to the environment.

Precautionary statement(s): Response

Not Applicable

Precautionary statement(s): Storage

Not Applicable

Precautionary statement(s): Disposal

P501	Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration
P502	Refer to manufacturer/supplier for information on recovery/recycling

Label elements

Relevant risk statements are found in section 2

Indication(s) of danger	Not Applicable

SAFETY ADVICE

S03	Keep in a cool place.
S15	Keep away from heat.
S29	Do not empty into drains.
S35	This material and its container must be disposed of in a safe way.
S56	Dispose of this material and its container at hazardous or special waste collection point.
S57	Use appropriate container to avoid environmental contamination.
S59	Refer to manufacturer/supplier for information on recovery/recycling.

Other hazards

	May produce discomfort of the eyes, respiratory tract and skin*.
	Inhalation may produce health damage*.
	Cumulative effects may result following exposure*.
	Vapours potentially cause drowsiness and dizziness*.
	Repeated exposure potentially causes skin dryness and cracking*.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
75-45-6	55	chlorodifluoromethane
75-68-3	41	chlorodifluoroethane
75-28-5.	4	iso-butane

SECTION 4 FIRST AID MEASURES

Continued...

Description of first aid measures

Eye Contact	▸ 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. ▸ The patient may be in great pain and wish to keep the eyes closed. It is important that the material is rinsed from the eyes to prevent further damage. ▸ Ensure that the patient looks up, and side to side as the eye is rinsed in order to better reach all parts of the eye(s) ▸ Transport to hospital or doctor. ▸ Even when no pain persists and vision is good, a doctor should examine the eye as delayed damage may occur. ▸ If the patient cannot tolerate light, protect the eyes with a clean, loosely tied bandage. ▸ Ensure verbal communication and physical contact with the patient. **DO NOT** allow the patient to rub the eyes **DO NOT** allow the patient to tightly shut the eyes **DO NOT** introduce oil or ointment into the eye(s) without medical advice **DO NOT** use hot or tepid water.
Skin Contact	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.
Inhalation	▸ 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. ▸ If the patient does not have a pulse, administer CPR. ▸ If medical oxygen and appropriately trained personnel are available, administer 100% oxygen. ▸ Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or Poison Control Centre for further instruction. ▸ Keep the patient warm, comfortable and at rest while awaiting medical care. ▸ **MONITOR THE BREATHING AND PULSE, CONTINUOUSLY.** ▸ Administer rescue breathing (preferably with a demand-valve resuscitator, bag-valve mask-device, or pocket mask as trained) or CPR if necessary.
Ingestion	▸ Not considered a normal route of entry. ▸ For advice, contact a Poisons Information Centre or a doctor. ▸ Avoid giving milk or oils. ▸ Avoid giving alcohol.

Indication of any immediate medical attention and special treatment needed

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 .
▸ Monitor and treat, where necessary, for shock.
▸ Anticipate seizures.

ADVANCED TREATMENT

▸ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
▸ Positive-pressure ventilation using a bag-valve mask might be of use.
▸ Monitor and treat, where necessary, for arrhythmias.
▸ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
▸ Drug therapy should be considered for pulmonary oedema.
▸ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
▸ Treat seizures with diazepam.
▸ Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

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

C: Decontamination

▸ Inhalation; remove victim from exposure, and give supplemental oxygen if available.
▸ Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:

▸ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition

▸ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
▸ No specific antidote.

Continued...

	▸ Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician. ▸ If lavage is performed, suggest endotracheal and/or esophageal control. ▸ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. ▸ Treatment based on judgment of the physician in response to reactions of the patient **DO NOT** administer sympathomimetic drugs as they may cause ventricular arrhythmias.

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

	SMALL FIRE: Use extinguishing agent suitable for type of surrounding fire. **LARGE FIRE:** Cool cylinder.

Special hazards arising from the substrate or mixture

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

Advice for firefighters

Fire Fighting	--- GENERAL --- ▸ Alert Fire Brigade and tell them location and nature of hazard.
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.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Minor Spills	▸ Vented gas is more dense than air and may collect in pits, basements. ▸ Atmospheres must be tested and O.K. before work resumes after leakage. ▸ Obtain a work permit before attempting any repairs.
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.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	▸ Containers, even those that have been emptied, may contain explosive vapours. ▸ Do NOT cut, drill, grind, weld or perform similar operations on or near containers. ▸ Electrostatic discharge may be generated during pumping - this may result in fire. ▸ Ensure electrical continuity by bonding and grounding (earthing) all equipment.
Other information	▸ Store below 38 deg. C. ▸ 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.

Conditions for safe storage, including any incompatibilities

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	▸ Avoid reaction with oxidising agents ▸ Avoid magnesium, aluminium and their alloys, brass and steel. 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.

PACKAGE MATERIAL INCOMPATIBILITIES

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	chlorodifluoromethane	Chlorodifluoromethane	3540 (mg/m3) / 1000 (ppm)	Not Available	Not Available	Not Available

Continued...

EMERGENCY LIMITS

Ingredient	TEEL-0	TEEL-1	TEEL-2	TEEL-3
chlorodifluoromethane	1000(ppm)	1250(ppm)	7500(ppm)	7500(ppm)
chlorodifluoroethane	1000(ppm)	10000(ppm)	15000(ppm)	25000(ppm)
iso-butane	800(ppm)	2400(ppm)	4000(ppm)	15000(ppm)

Ingredient	Original IDLH	Revised IDLH
A-Gas R406A	Not Available	Not Available

Exposure controls

Appropriate 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.
Personal protection	
Eye and face protection	▸ 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 lenses or restrictions on use, should be created for each workplace or task.
Skin protection	See Hand protection below
Hand protection	▸ 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. Insulated gloves are not made to permit hands to be placed in the liquid; they provide only short-term protection from accidental contact with the liquid.
Body protection	See Other protection below
Other protection	▸ 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.
Thermal hazards	

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) are taken into account in the A-Gas R406A Not Available

Material	CPI

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion

Respiratory protection

Type AX-P Filter of sufficient capacity

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas/vapour concentration present in air p.p.m. (by volume)	Half-face Respirator	Full-Face Respirator
up to 10	1000	AX-AUS / Class1 P2	-
up to 50	1000	-	AX-AUS / Class 1 P2
up to 50	5000	Airline *	-
up to 100	5000	-	AX-2 P2
up to 100	10000	-	AX-3 P2
100+			Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Colourless pressurised liquefied gas with no odour; does not mix with water.

Physical state	Liquified Gas	**Relative density (Water = 1)**	1.13 @ 25 deg.C
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	-632 to -635

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pH (as supplied)	Not Applicable	**Decomposition temperature**	96
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	-32 to -23	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	Not Applicable	**Taste**	Not Available
Evaporation rate	Not Applicable	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Applicable	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Applicable	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	562 @ 20 deg.C	**Gas group**	Not Available
Solubility in water (g/L)	Immiscible	**pH as a solution(1%)**	Not Applicable
Vapour density (Air = 1)	>3	**VOC g/L**	

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur. ▸ Presence of elevated temperatures.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

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. Common, generalised symptoms associated with non-toxic gas inhalation include : ▸ central nervous system effects such as headache, confusion, dizziness, progressive stupor, coma and seizures; ▸ respiratory system complications may include tachypnoea and dyspnoea;
Ingestion	Not normally a hazard due to physical form of product. Considered an unlikely route of entry in commercial/industrial environments
Skin Contact	In common with other halogenated aliphatics, fluorocarbons may cause dermal problems due to a tendency to remove natural oils from the skin causing irritation and the development of dry, sensitive skin. They do not appear to be appreciably absorbed. Material on the skin evaporates rapidly and may cause tingling, chilling and even temporary numbness Vapourising liquid causes rapid cooling and contact may cause cold burns, frostbite, even through normal gloves.
Eye	Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur. 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.
Chronic	Principal route of occupational exposure to the gas is by inhalation. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. It is generally accepted that the fluorocarbons are less toxic than the corresponding halogenated aliphatic based on chlorine. Repeated inhalation exposure to the fluorocarbon FC-11 does not produce pathologic lesions of the liver and other visceral organs in experimental animals.

A-Gas R406A	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
chlorodifluoromethane	**TOXICITY**	**IRRITATION**
	Inhalation (rat) LC50: 35 pph/15M	
	Not Available	Not Available
chlorodifluoroethane	**TOXICITY**	**IRRITATION**
	Inhalation (Mouse) LC50: 1758000 mg/m3/2h	
	Inhalation (Rat) LC50: 2050000 mg/m3/4h	
	Not Available	Not Available

Continued...

	TOXICITY	IRRITATION
iso-butane	Inhalation (Mouse) LC50: 52 mg/kg/1h *	
	Not Available	Not Available

Not available. Refer to individual constituents.

CHLORODIFLUOROMETHANE	The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
CHLORODIFLUOROETHANE	for chlorodifluoroethane (syn 1-chloro-1,1-difluoroethane): **Acute toxicity** of 1-chloro-l,l-difluoroethane is low (LC50/6h >1,640,000 mg/m3 (400,000 ppm) in rats). Inhalation of high concentrations induced signs of lung irritation and Central Nervous System depressing effects of anesthetic type in rats and cardiac sensitisation in dogs. - *(Toxicity data for approx. 45% gas, 55% air)
ISO-BUTANE	*WISER

Acute Toxicity	⦸	**Carcinogenicity**	⦸
Skin Irritation/Corrosion	⦸	**Reproductivity**	⦸
Serious Eye Damage/Irritation	⦸	**STOT - Single Exposure**	⦸
Respiratory or Skin sensitisation	⦸	**STOT - Repeated Exposure**	⦸
Mutagenicity	⦸	**Aspiration Hazard**	⦸

CMR STATUS

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Drinking Water Standards: hydrocarbon total: 10 ug/l (UK max.).
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
Not Available	Not Available	Not Available

Bioaccumulative potential

Ingredient	Bioaccumulation
Not Available	Not Available

Mobility in soil

Ingredient	Mobility
Not Available	Not Available

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	▸ 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 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO
HAZCHEM	2TE

Land transport (ADG)

UN number	1078

Continued...

Packing group	Not Available
UN proper shipping name	REFRIGERANT GAS, N.O.S.
Environmental hazard	No relevant data
Transport hazard class(es)	Class: 2.2 Subrisk:
Special precautions for user	Special provisions: 274 limited quantity: 120 ml

Air transport (ICAO-IATA / DGR)

UN number	1078
Packing group	Not Available
UN proper shipping name	Refrigerant gas, n.o.s. *
Environmental hazard	No relevant data
Transport hazard class(es)	ICAO/IATA Class: 2.2 ICAO / IATA Subrisk: ERG Code: 2L
Special precautions for user	Special provisions: Cargo Only Packing Instructions: 200 Cargo Only Maximum Qty / Pack: 150 kg Passenger and Cargo Packing Instructions: 200 Passenger and Cargo Maximum Qty / Pack: 75 kg Passenger and Cargo Limited Quantity Packing Instructions: Forbidden Passenger and Cargo Maximum Qty / Pack: Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number	1078
Packing group	Not Available
UN proper shipping name	REFRIGERANT GAS, N.O.S.
Environmental hazard	No relevant data
Transport hazard class(es)	IMDG Class: 2.2 IMDG Subrisk:
Special precautions for user	EMS Number: F-C,S-V Special provisions: 274 Limited Quantities: 120 ml

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

chlorodifluoromethane(75-45-6) is found on the following regulatory lists	"International Council of Chemical Associations (ICCA) - High Production Volume List","International Maritime Dangerous Goods Requirements (IMDG Code)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5","International Maritime Dangerous Goods Requirements (IMDG Code) - Substance Index","Australia Exposure Standards","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (Domestic water supply - disinfection by-products)","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes","Australia FAISD Handbook - First Aid Instructions, Warning Statements, and General Safety Precautions","United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (English)","OECD List of High Production Volume (HPV) Chemicals","Australia Drinking Water Guideline Values For Physical and Chemical Characteristics","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Aquatic habitat)","Sigma-AldrichTransport Information","WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water","Australia Dangerous Goods Code (ADG Code) - Packing Instruction - Liquefied and Dissolved Gases","United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (Spanish)","Australia Customs (Prohibited Exports) Regulations 1958 - Schedule 15 Ozone depleting substances - Part 5 Hydrochlorofluorocarbons","Australia National Pollutant Inventory","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm - Domestic water supply quality","International Air Transport Association (IATA) Dangerous Goods Regulations","Australia Hazardous Substances Information System - Consolidated Lists","Regulations concerning the International Carriage of Dangerous Goods by Rail - Table A: Dangerous Goods List - RID 2013 (English)","Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (AQUA/1 to 6 - non-pesticide anthropogenic organics)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)"

Continued...

chlorodifluoroethane(75-68-3) is found on the following regulatory lists	"International Council of Chemical Associations (ICCA) - High Production Volume List","International Maritime Dangerous Goods Requirements (IMDG Code)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5","Australia - Victoria Occupational Health and Safety Regulations - Schedule 9: Materials at Major Hazard Facilities (And Their Threshold Quantity) Table 2","International Maritime Dangerous Goods Requirements (IMDG Code) - Substance Index","Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes","United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (English)","Australia FAISD Handbook - First Aid Instructions, Warning Statements, and General Safety Precautions","OECD List of High Production Volume (HPV) Chemicals","International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft","Sigma-AldrichTransport Information","Australia Dangerous Goods Code (ADG Code) - Packing Instruction - Liquefied and Dissolved Gases","United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (Spanish)","Australia Customs (Prohibited Exports) Regulations 1958 - Schedule 15 Ozone depleting substances - Part 5 Hydrochlorofluorocarbons","Australia National Pollutant Inventory","International Air Transport Association (IATA) Dangerous Goods Regulations","Regulations concerning the International Carriage of Dangerous Goods by Rail - Table A: Dangerous Goods List - RID 2013 (English)","Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)","Acros Transport Information"
iso-butane(75-28-5.) is found on the following regulatory lists	"International Council of Chemical Associations (ICCA) - High Production Volume List","International Maritime Dangerous Goods Requirements (IMDG Code)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5","Australia - Victoria Occupational Health and Safety Regulations - Schedule 9: Materials at Major Hazard Facilities (And Their Threshold Quantity) Table 2","International Maritime Dangerous Goods Requirements (IMDG Code) - Substance Index","Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes","United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (English)","Australia FAISD Handbook - First Aid Instructions, Warning Statements, and General Safety Precautions","OECD List of High Production Volume (HPV) Chemicals","International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft","International Numbering System for Food Additives","Australia Dangerous Goods Code (ADG Code) - Packing Instruction - Liquefied and Dissolved Gases","United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (Spanish)","Australia High Volume Industrial Chemical List (HVICL)","Australia National Pollutant Inventory","International Air Transport Association (IATA) Dangerous Goods Regulations","Regulations concerning the International Carriage of Dangerous Goods by Rail - Table A: Dangerous Goods List - RID 2013 (English)","Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)"

SECTION 16 OTHER INFORMATION

Other information

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 the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.