



## A-Gas R23

A-Gas (Singapore) PTE LTD

Chemwatch: 15-8357

Version No: 3.1.1.1

Material Safety Data Sheet according to NOHSC and ADG requirements

Chemwatch Hazard Alert Code: 2

Issue Date: 09/09/2013

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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 R23                               |
| Chemical Name                 | TRIFLUOROMETHANE                        |
| Synonyms                      | Not Available                           |
| Proper shipping name          | TRIFLUOROMETHANE (REFRIGERANT GAS R 23) |
| Chemical formula              | Not Applicable                          |
| Other means of identification | Not Available                           |
| CAS number                    | 75-46-7                                 |

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

|                          |              |
|--------------------------|--------------|
| Relevant identified uses | Refrigerant. |
|--------------------------|--------------|

#### 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<br>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 preferred 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   |     | 0 = Minimum  |
| Toxicity     | 2   |     | 1 = Low      |
| Body Contact | 2   |     | 2 = Moderate |
| Reactivity   | 1   |     | 3 = High     |
| Chronic      | 2   |     | 4 = Extreme  |

|                                   |   |
|-----------------------------------|---|
| Poisons Schedule                  | None  |
| Risk Phrases <sup>[1]</sup>       | <b>R44</b> Risk of explosion if heated under confinement.<br><b>R04</b> Forms very sensitive explosive metallic compounds.    |
| Legend:                           | 1. Classified by Chemwatch; 2. Classification drawn from HSIS; 3. Classification drawn from EC Directive 1272/2008 - Annex VI |
| GHS Classification <sup>[1]</sup> | Gas under Pressure (Compressed gas)   |

**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 | <b>WARNING</b> |
|-------------|----------------|

**Hazard statement(s)**

|        |  |
|--------|--|
| H280   | Contains gas under pressure; may explode if heated |
| AUH044 | Risk of explosion if heated under confinement      |

**Precautionary statement(s): Prevention**

Not Applicable

**Precautionary statement(s): Response**

Not Applicable

**Precautionary statement(s): Storage**

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

**Precautionary statement(s): Disposal**

Not Applicable

**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.   |
| S56 | Dispose of this material and its container at hazardous or special waste collection point. |

**Other hazards**

|  |  |
|--|--|
|  | Inhalation may produce health damage*.               |
|  | Cumulative effects may result following exposure*.   |
|  | May produce skin discomfort*.                        |
|  | Vapours potentially cause drowsiness and dizziness*. |

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**

**Substances**

See section below for composition of Mixtures

**Mixtures**

| CAS No  | %[weight] | Name                             |
|---------|-----------|----------------------------------|
| 75-46-7 | >99.5     | <a href="#">trifluoromethane</a> |

**SECTION 4 FIRST AID MEASURES**

**Description of first aid measures**

|                    |  |
|--------------------|--|
| <b>Eye Contact</b> | <ul style="list-style-type: none"> <li>▶ If product comes in contact with eyes remove the patient from gas source or contaminated area.</li> <li>▶ Take the patient to the nearest eye wash, shower or other source of clean water.</li> <li>▶ Open the eyelid(s) wide to allow the material to evaporate.</li> <li>▶ 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.</li> <li>▶ 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.</li> <li>▶ 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)</li> <li>▶ Transport to hospital or doctor.</li> <li>▶ Even when no pain persists and vision is good, a doctor should examine the eye as delayed damage may occur.</li> <li>▶ If the patient cannot tolerate light, protect the eyes with a clean, loosely tied bandage.</li> <li>▶ Ensure verbal communication and physical contact with the patient.</li> </ul> <p><b>DO NOT</b> allow the patient to rub the eyes<br/> <b>DO NOT</b> allow the patient to tightly shut the eyes<br/> <b>DO NOT</b> introduce oil or ointment into the eye(s) without medical advice<br/> <b>DO NOT</b> use hot or tepid water.</p> |
|--------------------|--|

|                     |  |
|---------------------|--|
| <b>Skin Contact</b> | <p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>  |
| <b>Inhalation</b>   | <ul style="list-style-type: none"> <li>▶ Following exposure to gas, remove the patient from the gas source or contaminated area.</li> <li>▶ NOTE: Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer.</li> <li>▶ Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ If the patient is not breathing spontaneously, administer rescue breathing.</li> <li>▶ If the patient does not have a pulse, administer CPR.</li> <li>▶ If medical oxygen and appropriately trained personnel are available, administer 100% oxygen.</li> <li>▶ Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or Poison Control Centre for further instruction.</li> <li>▶ Keep the patient warm, comfortable and at rest while awaiting medical care.</li> <li>▶ <b>MONITOR THE BREATHING AND PULSE, CONTINUOUSLY.</b></li> <li>▶ Administer rescue breathing (preferably with a demand-valve resuscitator, bag-valve mask-device, or pocket mask as trained) or CPR if necessary.</li> </ul> |
| <b>Ingestion</b>    | <ul style="list-style-type: none"> <li>▶ Not considered a normal route of entry.</li> <li>▶ Avoid giving milk or oils.</li> <li>▶ Avoid giving alcohol.</li> </ul>   |

**Indication of any immediate medical attention and special treatment needed**

|  |  |
|--|--|
|  | <p>for intoxication due to Freons/ Halons;</p> <p>A: Emergency and Supportive Measures</p> <ul style="list-style-type: none"> <li>▶ Maintain an open airway and assist ventilation if necessary</li> <li>▶ 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.</li> <li>▶ Monitor the ECG for 4-6 hours</li> </ul> <p>B: Specific drugs and antidotes:</p> <ul style="list-style-type: none"> <li>▶ There is no specific antidote</li> </ul> <p>C: Decontamination</p> <ul style="list-style-type: none"> <li>▶ Inhalation; remove victim from exposure, and give supplemental oxygen if available.</li> <li>▶ Ingestion; (a) Prehospital: Administer activated charcoal, if available. <b>DO NOT</b> 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)</li> </ul> <p>D: Enhanced elimination:</p> <ul style="list-style-type: none"> <li>▶ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.</li> </ul> <p><i>POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition</i></p> <ul style="list-style-type: none"> <li>▶ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.</li> <li>▶ No specific antidote.</li> <li>▶ 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.</li> <li>▶ If lavage is performed, suggest endotracheal and/or esophageal control.</li> <li>▶ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.</li> <li>▶ Treatment based on judgment of the physician in response to reactions of the patient</li> </ul> <p>for gas exposures:</p> <p>-----</p> <p><b>BASIC TREATMENT</b></p> <p>-----</p> <ul style="list-style-type: none"> <li>▶ Establish a patent airway with suction where necessary.</li> <li>▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.</li> <li>▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.</li> <li>▶ Monitor and treat, where necessary, for pulmonary oedema .</li> <li>▶ Monitor and treat, where necessary, for shock.</li> <li>▶ Anticipate seizures.</li> </ul> <p>-----</p> <p><b>ADVANCED TREATMENT</b></p> <p>-----</p> <ul style="list-style-type: none"> <li>▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.</li> <li>▶ Positive-pressure ventilation using a bag-valve mask might be of use.</li> <li>▶ Monitor and treat, where necessary, for arrhythmias.</li> <li>▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.</li> <li>▶ Drug therapy should be considered for pulmonary oedema.</li> <li>▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.</li> <li>▶ Treat seizures with diazepam.</li> <li>▶ Proparacaine hydrochloride should be used to assist eye irrigation.</li> </ul> <p><i>BRONSTEIN, A.C. and CURRANCE, P.L.</i><br/> <i>EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994</i></p> |
|--|--|

**SECTION 5 FIREFIGHTING MEASURES**

**Extinguishing media**

|  |   |
|--|---|
|  | <p><b>SMALL FIRE:</b> Use extinguishing agent suitable for type of surrounding fire.</p> <p><b>LARGE FIRE:</b> Cool cylinder.</p> |
|--|---|

**Special hazards arising from the substrate or mixture**

|                             |             |
|-----------------------------|-------------|
| <b>Fire Incompatibility</b> | None known. |
|-----------------------------|-------------|

**Advice for firefighters**

|                              |   |
|------------------------------|---|
| <b>Fire Fighting</b>         | <p>GENERAL</p> <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> </ul>  |
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered a significant fire risk, however containers may burn.</li> </ul> <p>Decomposition may produce toxic fumes of:</p> |

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

|                     |  |
|---------------------|--|
| <b>Minor Spills</b> | <ul style="list-style-type: none"> <li>▶ Avoid breathing vapour and any contact with liquid or gas. Protective equipment including respirator should be used.</li> <li>▶ <b>DO NOT enter confined spaces were gas may have accumulated.</b></li> </ul>   |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Clear area of all unprotected personnel and move upwind.</li> <li>▶ Alert Emergency Authority and advise them of the location and nature of hazard.</li> <li>▶ Wear breathing apparatus and protective gloves.</li> <li>▶ Prevent by any means available, spillage from entering drains and water-courses.</li> </ul> |

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

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

|                          |   |
|--------------------------|---|
| <b>Safe handling</b>     | <ul style="list-style-type: none"> <li>▶ Consider use in closed pressurised systems, fitted with temperature, pressure and safety relief valves which are vented for safe dispersal.</li> <li>▶ The tubing network design connecting gas cylinders to the delivery system should include appropriate pressure indicators and vacuum or suction lines.</li> <li>▶ Fully-welded types of pressure gauges, where the bourdon tube sensing element is welded to the gauge body, are recommended.</li> <li>▶ Before connecting gas cylinders, ensure manifold is mechanically secure and does not containing another gas.</li> </ul> |
| <b>Other information</b> | <ul style="list-style-type: none"> <li>▶ Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open.</li> <li>▶ Such compounds should be sited and built in accordance with statutory requirements.</li> <li>▶ The storage compound should be kept clear and access restricted to authorised personnel only.</li> <li>▶ Cylinders stored in the open should be protected against rust and extremes of weather.</li> </ul>   |

### Conditions for safe storage, including any incompatibilities

|                                |   |
|--------------------------------|---|
| <b>Suitable container</b>      | <ul style="list-style-type: none"> <li>▶ Cylinder:</li> <li>▶ Ensure the use of equipment rated for cylinder pressure.</li> <li>▶ Ensure the use of compatible materials of construction.</li> <li>▶ Valve protection cap to be in place until cylinder is secured, connected.</li> </ul>   |
| <b>Storage incompatibility</b> | <p>Haloalkanes:</p> <ul style="list-style-type: none"> <li>▶ 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.</li> <li>▶ may react with the lighter divalent metals to produce more reactive compounds analogous to Grignard reagents.</li> <li>▶ may produce explosive compounds following prolonged contact with metallic or other azides</li> </ul> |

### PACKAGE MATERIAL INCOMPATIBILITIES

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA


Not Available

#### EMERGENCY LIMITS

| Ingredient       | TEEL-0   | TEEL-1    | TEEL-2     | TEEL-3      |
|------------------|----------|-----------|------------|-------------|
| trifluoromethane | 750(ppm) | 3000(ppm) | 20000(ppm) | 100000(ppm) |

| Ingredient | Original IDLH | Revised IDLH  |
|------------|---------------|---------------|
| A-Gas R23  | Not Available | Not Available |

### Exposure controls

|   |   |
|---|---|
| <b>Appropriate engineering controls</b> | <p>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:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> |
| <b>Personal protection</b>              |   |

|                                |   |
|--------------------------------|---|
| <b>Eye and face protection</b> | <ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles.</li> <li>▶ 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.</li> </ul> |
| <b>Skin protection</b>         | See Hand protection below   |
| <b>Hand protection</b>         | <ul style="list-style-type: none"> <li>▶ When handling sealed and suitably insulated cylinders wear cloth or leather gloves.</li> </ul>   |
| <b>Body protection</b>         | See Other protection below  |
| <b>Other protection</b>        | <ul style="list-style-type: none"> <li>▶ Protective overalls, closely fitted at neck and wrist.</li> <li>▶ Eye-wash unit.</li> <li>▶ Ensure availability of lifeline in confined spaces.</li> <li>▶ Staff should be trained in all aspects of rescue work.</li> </ul>   |
| <b>Thermal hazards</b>         |   |

**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 R23 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 Filter of sufficient capacity

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

| Required Minimum Protection Factor | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|------------------------------------|----------------------|----------------------|------------------------|
| up to 10 x ES                      | AX-AUS               | -                    | AX-PAPR-AUS / Class 1  |
| up to 50 x ES                      | -                    | AX-AUS / Class 1     | -                      |
| up to 100 x ES                     | -                    | AX-2                 | AX-PAPR-2 ^            |

^ - Full-face

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(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), 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**

|   |   |  |                        |
|---|---|--|------------------------|
| <b>Appearance</b>                                   | Colourless pressurised liquified gas with a slightly ethereal odour; slightly soluble in water. |  |                        |
| <b>Physical state</b>                               | Compressed Gas  | <b>Relative density (Water = 1)</b>            | 1.22                   |
| <b>Odour</b>  | Not Available   | <b>Partition coefficient n-octanol / water</b> | Not Available          |
| <b>Odour threshold</b>                              | Not Available   | <b>Auto-ignition temperature (°C)</b>          | Not Applicable         |
| <b>pH (as supplied)</b>                             | Neutral   | <b>Decomposition temperature</b>               | Not Available          |
| <b>Melting point / freezing point (°C)</b>          | -155 (freezing point)   | <b>Viscosity (cSt)</b>                         | 0.106 mPa.s @ 25 deg.C |
| <b>Initial boiling point and boiling range (°C)</b> | -82.1   | <b>Molecular weight (g/mol)</b>                | 70                     |
| <b>Flash point (°C)</b>                             | Not Applicable  | <b>Taste</b>                                   | Not Available          |
| <b>Evaporation rate</b>                             | Fast  | <b>Explosive properties</b>                    | Not Available          |
| <b>Flammability</b>                                 | Not Available   | <b>Oxidising properties</b>                    | Not Available          |
| <b>Upper Explosive Limit (%)</b>                    | Not Applicable  | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Available          |
| <b>Lower Explosive Limit (%)</b>                    | Not Applicable  | <b>Volatile Component (%vol)</b>               | 100                    |
| <b>Vapour pressure (kPa)</b>                        | 4185 @ 20 deg.C   | <b>Gas group</b>                               | Not Available          |
| <b>Solubility in water (g/L)</b>                    | Partly Miscible   | <b>pH as a solution(1%)</b>                    | Not Available          |
| <b>Vapour density (Air = 1)</b>                     | 2.4   | <b>VOC g/L</b>                                 |                        |

**SECTION 10 STABILITY AND REACTIVITY**

|                   |               |
|-------------------|---------------|
| <b>Reactivity</b> | See section 7 |
|-------------------|---------------|

|   |  |
|---|--|
| <b>Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▶ Presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</li> <li>▶ Presence of elevated temperatures.</li> </ul> |
| <b>Possibility of hazardous reactions</b> | See section 7  |
| <b>Conditions to avoid</b>                | See section 7  |
| <b>Incompatible materials</b>             | See section 7  |
| <b>Hazardous decomposition products</b>   | See section 5  |

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

|                     |   |
|---------------------|---|
| <b>Inhaled</b>      | <p>Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.</p> <p>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.</p> <p>Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas.</p>   |
| <b>Ingestion</b>    | <p>Overexposure is unlikely in this form.</p> <p>Not normally a hazard due to physical form of product.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p>  |
| <b>Skin Contact</b> | <p>Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.</p> |
| <b>Eye</b>          | <p>Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).</p> <p>Direct contact with the eye may not cause irritation because of the extreme volatility of the gas; however concentrated atmospheres may produce irritation after brief exposures..</p>   |
| <b>Chronic</b>      | <p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p> <p>Principal route of occupational exposure to the gas is by inhalation.</p> <p>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.</p>  |

|                         |                 |                   |
|-------------------------|-----------------|-------------------|
| <b>A-Gas R23</b>        | <b>TOXICITY</b> | <b>IRRITATION</b> |
|                         | Not Available   | Not Available     |
| <b>trifluoromethane</b> | <b>TOXICITY</b> | <b>IRRITATION</b> |
|                         | Not Available   | Not Available     |

Not available. Refer to individual constituents.

|                         |   |
|-------------------------|---|
| <b>TRIFLUOROMETHANE</b> | <p>No significant acute toxicological data identified in literature search.</p> <p>Repeated exposure of dogs to 5000 ppm and rats to 1000 ppm resulted in no toxic effects.</p> |
|-------------------------|---|

|  |   |                                 |   |
|--|---|---------------------------------|---|
| <b>Acute Toxicity</b>                    | ⊖ | <b>Carcinogenicity</b>          | ⊖ |
| <b>Skin Irritation/Corrosion</b>         | ⊖ | <b>Reproductivity</b>           | ⊖ |
| <b>Serious Eye Damage/Irritation</b>     | ⊖ | <b>STOT - Single Exposure</b>   | ⊖ |
| <b>Respiratory or Skin sensitisation</b> | ⊖ | <b>STOT - Repeated Exposure</b> | ⊖ |
| <b>Mutagenicity</b>                      | ⊖ | <b>Aspiration Hazard</b>        | ⊖ |

### CMR STATUS

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

Although small amounts of fluorides are conceded to have beneficial effects, two forms of chronic toxic effect, dental fluorosis and skeletal fluorosis may be caused by excessive intake over long periods. Fluorides are absorbed by humans following inhalation of workplace and ambient air that has been contaminated, ingestion of drinking water and foods and dermal contact.

Both hydrogen fluoride and particulate fluorides will be transported in the atmosphere and deposited on land or water by wet and dry deposition.

### 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 |  |
|------------------------------|--|
|                              | For small quantities:<br>▶ Cautiously dissolve in water<br>▶ Neutralise with sodium carbonate or if product does not dissolve completely add a small quantity of hydrochloric acid followed by sodium carbonate<br>▶ Add excess calcium chloride to precipitate the fluoride and/ or carbonate |

**SECTION 14 TRANSPORT INFORMATION****Labels Required**

|                  |  |
|------------------|--|
|                  |  |
| Marine Pollutant | NO   |
| HAZCHEM          | 2T   |

**Land transport (ADG)**

|                              |   |
|------------------------------|---|
| UN number                    | 1984  |
| Packing group                | Not Available                                     |
| UN proper shipping name      | TRIFLUOROMETHANE (REFRIGERANT GAS R 23)           |
| Environmental hazard         | No relevant data                                  |
| Transport hazard class(es)   | Class : 2.2<br>Subrisk :                          |
| Special precautions for user | Special provisions :<br>limited quantity : 120 ml |

**Air transport (ICAO-IATA / DGR)**

|                              |  |
|------------------------------|--|
| UN number                    | 1984   |
| Packing group                | Not Available  |
| UN proper shipping name      | Trifluoromethane (R23); Refrigerant gas R 23   |
| Environmental hazard         | No relevant data   |
| Transport hazard class(es)   | ICAO/IATA Class : 2.2<br>ICAO / IATA Subrisk :<br>ERG Code : 2A  |
| Special precautions for user | Special provisions :<br>Cargo Only Packing Instructions : 200<br>Cargo Only Maximum Qty / Pack : 150 kg<br>Passenger and Cargo Packing Instructions : 200<br>Passenger and Cargo Maximum Qty / Pack : 75 kg<br>Passenger and Cargo Limited Quantity Packing Instructions : Forbidden<br>Passenger and Cargo Maximum Qty / Pack : Forbidden |

**Sea transport (IMDG-Code / GGVSee)**

|           |      |
|-----------|------|
| UN number | 1984 |
|-----------|------|

|                                     |   |
|-------------------------------------|---|
| <b>Packing group</b>                | Not Available   |
| <b>UN proper shipping name</b>      | TRIFLUOROMETHANE (REFRIGERANT GAS R 23)                                     |
| <b>Environmental hazard</b>         | No relevant data  |
| <b>Transport hazard class(es)</b>   | IMDG Class : 2.2<br>IMDG Subrisk :  |
| <b>Special precautions for user</b> | EMS Number : F-C,S-V<br>Special provisions :<br>Limited Quantities : 120 ml |

## SECTION 15 REGULATORY INFORMATION

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

|   |  |
|---|--|
| <b>trifluoromethane(75-46-7) is found on the following regulatory lists</b> | "International Maritime Dangerous Goods Requirements (IMDG Code)", "International Maritime Dangerous Goods Requirements (IMDG Code) - Substance Index", "Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (Domestic water supply - disinfection by-products)", "Australia Dangerous Goods Code (ADG Code) - List of Emergency Action Codes", "United Nations Recommendations on the Transport of Dangerous Goods Model Regulations (English)", "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)", "Australia Customs (Prohibited Exports) Regulations 1958 - Schedule 15 Ozone depleting substances - Part 9 HFCs", "WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water", "Sigma-Aldrich Transport 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 - 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", "Regulations concerning the International Carriage of Dangerous Goods by Rail - Table A: Dangerous Goods List - RID 2013 (English)", "Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (AQUA/1 to 6 - non-pesticide anthropogenic organics)", "Australia Dangerous Goods Code (ADG Code) - Dangerous Goods List" |
|---|--|

## 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](http://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.

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