

## R123

### A-Gas

Chemwatch Hazard Alert Code: 2

Chemwatch: 6100-23

Issue Date: 17/02/2016

Version No: 7.1.1.1

Print Date: 04/04/2018

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

L.GHS.USA.EN

## SECTION 1 IDENTIFICATION

### Product Identifier

<b>Product name</b>	R123
<b>Chemical Name</b>	2,2-dichloro-1,1,1-trifluoroethane
<b>Synonyms</b>	HCFC-123; Suva123; Solkane 123; R 123; HFA-123
<b>Other means of identification</b>	Not Available

### Recommended use of the chemical and restrictions on use

<b>Relevant identified uses</b>	Use according to manufacturer's directions. 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.
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### Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	A-Gas	A-Gas	Rapid Recovery part of A-Gas Group
<b>Address</b>	11050 South Highway 287 TX 76078 United States	1100 Haskins Rd OH 43402 United States	8932 WEST CACTUS ROAD ARIZONA 85381 United States
<b>Telephone</b>	817-636-2089	14198678990	877-372-7732
<b>Fax</b>	817.636.9007	1-419-867-3279	877-572-7732
<b>Website</b>	www.agasamericas.com	www.agasamericas.com	www.raprec.com
<b>Email</b>	tammy.myers@agas.com	tammy.myers@agas.com	ryan.olson@raprec.com

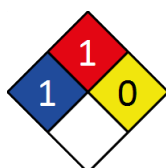
### Emergency phone number

Association / Organisation	Chemtrec	PERS	PERS
<b>Emergency telephone numbers</b>	1-800-424-9300	1-800-633-8253	US 1-800-633-8253
<b>Other emergency telephone numbers</b>	Not Available	International 1-801-629-0667	International 1-801-629-0667

## SECTION 2 HAZARD(S) IDENTIFICATION

### Classification of the substance or mixture


NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

<b>Classification</b>	Carcinogenicity Category 2, Lactation Effects, Specific target organ toxicity - repeated exposure Category 2, Acute Aquatic Hazard Category 3, Chronic Aquatic Hazard Category 3
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### Label elements

<b>Hazard pictogram(s)</b>	
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<b>SIGNAL WORD</b>	<b>WARNING</b>
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**Hazard statement(s)**

<b>H351</b>	Suspected of causing cancer.
<b>H362</b>	May cause harm to breast-fed children.
<b>H373</b>	May cause damage to organs through prolonged or repeated exposure.
<b>H412</b>	Harmful to aquatic life with long lasting effects.

**Hazard(s) not otherwise specified**

Not Applicable

**Precautionary statement(s) Prevention**

<b>P201</b>	Obtain special instructions before use.
<b>P260</b>	Do not breathe dust/fume/gas/mist/vapours/spray.
<b>P263</b>	Avoid contact during pregnancy/while nursing.
<b>P281</b>	Use personal protective equipment as required.

**Precautionary statement(s) Response**

<b>P308+P313</b>	IF exposed or concerned: Get medical advice/attention.
<b>P314</b>	Get medical advice/attention if you feel unwell.

**Precautionary statement(s) Storage**

<b>P405</b>	Store locked up.
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**Precautionary statement(s) Disposal**

<b>P501</b>	Dispose of contents/container in accordance with local regulations.
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**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**

**Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
306-83-2	>99.5	<u>R123</u>

**SECTION 4 FIRST-AID MEASURES**

**Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with fresh running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Seek medical attention without delay; if pain persists or recurs seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<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>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained.</li> </ul>

	<ul style="list-style-type: none"> <li>▶ Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ For advice, contact a Poisons Information Centre or a doctor.</li> <li>▶ Avoid giving milk or oils.</li> <li>▶ Avoid giving alcohol.</li> <li>▶ <b>If swallowed do NOT induce vomiting.</b></li> <li>▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>▶ Observe the patient carefully.</li> <li>▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</li> <li>▶ Seek medical advice.</li> </ul>

### Most important symptoms and effects, both acute and delayed

See Section 11

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

Treat symptomatically.

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.
- ▶ 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

## SECTION 5 FIRE-FIGHTING MEASURES

### Extinguishing media

- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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### Special protective equipment and precautions for fire-fighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear full body protective clothing with breathing apparatus.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> <li>▶ Use water delivered as a fine spray to control fire and cool adjacent area.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Combustible.</li> <li>▶ Slight fire hazard when exposed to heat or flame.</li> <li>▶ Heating may cause expansion or decomposition leading to violent rupture of containers.</li> <li>▶ On combustion, may emit toxic fumes of carbon monoxide (CO).</li> </ul> <p>Combustion products include:</p> <ul style="list-style-type: none"> <li>, carbon dioxide (CO2)</li> <li>, hydrogen chloride</li> </ul>

,  
phosgene  
,  
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.  
May emit poisonous fumes.  
May emit corrosive fumes.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Remove all ignition sources.</li> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> </ul>																																																																											
<b>Major Spills</b>	<p>Chemical Class: aliphatics, halogenated For release onto land: recommended sorbents listed in order of priority.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">SORBENT TYPE</th> <th style="width: 10%;">RANK</th> <th style="width: 30%;">APPLICATION</th> <th style="width: 10%;">COLLECTION</th> <th style="width: 20%;">LIMITATIONS</th> </tr> </thead> <tbody> <tr> <td colspan="5"><b>LAND SPILL - SMALL</b></td> </tr> <tr> <td>cross-linked polymer - particulate</td> <td style="text-align: center;">1</td> <td>shovel</td> <td>shovel</td> <td>R, W, SS</td> </tr> <tr> <td>cross-linked polymer - pillow</td> <td style="text-align: center;">1</td> <td>throw</td> <td>pitchfork</td> <td>R, DGC, RT</td> </tr> <tr> <td>wood fiber - pillow</td> <td style="text-align: center;">2</td> <td>throw</td> <td>pitchfork</td> <td>R, P, DGC, RT</td> </tr> <tr> <td>treated wood fibre - particulate</td> <td style="text-align: center;">2</td> <td>shovel</td> <td>shovel</td> <td>R, W, DGC</td> </tr> <tr> <td>sorbent clay - particulate</td> <td style="text-align: center;">3</td> <td>shovel</td> <td>shovel</td> <td>R, I, P</td> </tr> <tr> <td>foamed glass - pillow</td> <td style="text-align: center;">3</td> <td>throw</td> <td>pitchfork</td> <td>R, P, DGC, RT</td> </tr> <tr> <td colspan="5"><b>LAND SPILL - MEDIUM</b></td> </tr> <tr> <td>cross-linked polymer - particulate</td> <td style="text-align: center;">1</td> <td>blower</td> <td>skiloader</td> <td>R,W, SS</td> </tr> <tr> <td>cross-linked polymer - pillow</td> <td style="text-align: center;">2</td> <td>throw</td> <td>skiloader</td> <td>R, DGC, RT</td> </tr> <tr> <td>sorbent clay - particulate</td> <td style="text-align: center;">3</td> <td>blower</td> <td>skiloader</td> <td>R, I, P</td> </tr> <tr> <td>polypropylene - particulate</td> <td style="text-align: center;">3</td> <td>blower</td> <td>skiloader</td> <td>W, SS, DGC</td> </tr> <tr> <td>foamed glass - pillow</td> <td style="text-align: center;">3</td> <td>throw</td> <td>skiloader</td> <td>R, P, DGC, RT</td> </tr> <tr> <td>expanded mineral - particulate</td> <td style="text-align: center;">4</td> <td>blower</td> <td>skiloader</td> <td>R, I, W, P, DGC</td> </tr> </tbody> </table> <p>Legend DGC: Not effective where ground cover is dense R; Not reusable I: Not incinerable P: Effectiveness reduced when rainy RT:Not effective where terrain is rugged SS: Not for use within environmentally sensitive sites W: Effectiveness reduced when windy Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control; R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988 Moderate hazard.</p> <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves.</li> </ul>	SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS	<b>LAND SPILL - SMALL</b>					cross-linked polymer - particulate	1	shovel	shovel	R, W, SS	cross-linked polymer - pillow	1	throw	pitchfork	R, DGC, RT	wood fiber - pillow	2	throw	pitchfork	R, P, DGC, RT	treated wood fibre - particulate	2	shovel	shovel	R, W, DGC	sorbent clay - particulate	3	shovel	shovel	R, I, P	foamed glass - pillow	3	throw	pitchfork	R, P, DGC, RT	<b>LAND SPILL - MEDIUM</b>					cross-linked polymer - particulate	1	blower	skiloader	R,W, SS	cross-linked polymer - pillow	2	throw	skiloader	R, DGC, RT	sorbent clay - particulate	3	blower	skiloader	R, I, P	polypropylene - particulate	3	blower	skiloader	W, SS, DGC	foamed glass - pillow	3	throw	skiloader	R, P, DGC, RT	expanded mineral - particulate	4	blower	skiloader	R, I, W, P, DGC
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Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

<b>Safe handling</b>	<p><b>Contains low boiling substance:</b> Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.</p> <ul style="list-style-type: none"> <li>▶ Check for bulging containers.</li> <li>▶ Vent periodically</li> <li>▶ Always release caps or seals slowly to ensure slow dissipation of vapours</li> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hollows and sumps.</li> <li>▶ <b>DO NOT allow clothing wet with material to stay in contact with skin</b></li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ No smoking, naked lights or ignition sources.</li> <li>▶ Store in a cool, dry, well-ventilated area.</li> </ul> <p> Storage temperature lt;50 deg.C.</p>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Metal can or drum</li> <li>▶ Packaging as recommended by manufacturer.</li> <li>▶ Check all containers are clearly labelled and free from leaks.</li> </ul>
<b>Storage incompatibility</b>	<ul style="list-style-type: none"> <li>▶ Avoid reaction with oxidising agents</li> </ul> <p>Segregate from:</p> <ul style="list-style-type: none"> <li>▶ powdered metals such as aluminium, zinc and</li> <li>▶ alkali metals such as sodium, potassium and lithium.</li> </ul> <p>May attack, soften or dissolve rubber, many plastics, paints and coatings</p> <ul style="list-style-type: none"> <li>▶ Avoid magnesium, aluminium and their alloys, brass and steel.</li> </ul>

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Not Available

#### EMERGENCY LIMITS


Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
R123	HCFC-123; (Dichloro-1,1,1-trifluoroethane, 2,2-)	150 ppm	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
R123	Not Available	Not Available

#### MATERIAL DATA

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. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable.

### 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.</p> <p>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> <p>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.</p>
<b>Personal protection</b>	

Continued...

<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>Hands/feet protection</b>	Personal hygiene is a key element of effective hand care. <ul style="list-style-type: none"> <li>▶ Protective gloves eg. Leather gloves or gloves with Leather facing</li> <li>▶ Wear chemical protective gloves, e.g. PVC.</li> <li>▶ Wear safety footwear or safety gumboots, e.g. Rubber</li> </ul>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C. apron.</li> <li>▶ Barrier cream.</li> </ul>
<b>Thermal hazards</b>	Not Available

### Respiratory protection

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

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	A-AUS / Class1 P3	-
up to 50	1000	-	A-AUS / Class 1 P3
up to 50	5000	Airline *	-
up to 100	5000	-	A-2 P3
up to 100	10000	-	A-3 P3
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(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>	Dark brown viscous, non-volatile, hygroscopic liquid with a slightly ethereal odour; insoluble in water.		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	1.58
<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>	350
<b>pH (as supplied)</b>	Not Applicable	<b>Decomposition temperature</b>	>160
<b>Melting point / freezing point (°C)</b>	<-100 (freezing point)	<b>Viscosity (cSt)</b>	7000 mPa.s
<b>Initial boiling point and boiling range (°C)</b>	>160	<b>Molecular weight (g/mol)</b>	152.9
<b>Flash point (°C)</b>	196 (OC)	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Available	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	Not Available	<b>Volatile Component (%vol)</b>	Not Available
<b>Vapour pressure (kPa)</b>	0.470 @ 20 deg.C	<b>Gas group</b>	Not Available
<b>Solubility in water (g/L)</b>	Immiscible	<b>pH as a solution (1%)</b>	Not Applicable
<b>Vapour density (Air = 1)</b>	>1	<b>VOC g/L</b>	Not Available

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> <li>▶ Hazardous polymerisation will not occur.</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 aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.</p> <p>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. This may happen with little warning of overexposure.</p> <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>Exposure to high concentrations of fluorocarbons may produce cardiac arrhythmias or cardiac arrest due to sensitisation of the heart to adrenalin or noradrenalin. Deaths associated with exposures to fluorocarbons (specifically halogenated aliphatics) have occurred in occupational settings and in inhalation of bronchodilator drugs.</p> <p>Bronchospasm consistently occurs in human subjects inhaling fluorocarbons. At a measured concentration of 1700 ppm of one of the commercially available aerosols there is a biphasic change in ventilatory capacity, the first reduction occurring within a few minutes and the second delayed up to 30 minutes.</p> <p>Depression of the central nervous system is the most outstanding effect of most halogenated aliphatic hydrocarbons. Inebriation and excitation, passing into narcosis, is a typical reaction. In severe acute exposures there is always a danger of death from respiratory failure or cardiac arrest due to a tendency to make the heart more susceptible to catecholamines (adrenalin)</p>
<b>Ingestion</b>	<p>The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health).</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> <p>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.</p> <p>Material on the skin evaporates rapidly and may cause tingling, chilling and even temporary numbness</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds 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.</p>
<b>Eye</b>	<p>Although the liquid 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>
<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>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. There has been conjecture in non-scientific publications that fluorocarbons may cause leukemia, cancer, sterility and birth defects; these have not been verified by current research. The high incidence of cancer, spontaneous abortion and congenital anomalies amongst hospital personnel, repeatedly exposed to fluorine-containing general anaesthetics, has caused some scientists to call for a lowering of the</p>

fluorocarbon exposure standard to 5 ppm since some are mutagens.

R123	TOXICITY	IRRITATION
	Dermal (Rat) LD50: >2000 mg/kg <sup>[2]</sup>	Guinea Pig, Non sensitising (skin)
	Inhalation (Rat) LC50: 200 mg/l <sup>[2]</sup>	Rabbit, slightly irritant (eyes)
	Oral (Rat) LD50: >2000 mg/kg <sup>[2]</sup>	Rabbit, slightly irritant (skin)
R123	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Not Available
	Inhalation (rat) LC50: 225.7 mg/l/4H <sup>[2]</sup>	
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

R123	<p>Chronic toxicity . Dog, &gt; 1 % v/v air , cardiac sensitisation following adrenergic stimulation . Inhalation, after prolonged exposure, rat, Target organ: liver, 30 ppm, observed effect . Inhalation, after repeated exposure, guinea pig, Target organ: liver / metabolism (lipids) / Endocrine system, 0.94 % v/v air , observed effect . Inhalation, after repeated exposure, monkey, Target organ: liver, 0.1 % v/v air , observed effect . Inhalation, after prolonged exposure, rabbit, Target organ: testes / pancreas / liver, Remark: Leydig cells/benign tumours . No mutagenic, teratogenic effects NOTE: The compound is non-irritating to skin and does not act as a skin sensitiser in experimental animals. [Du Pont]* No data exist on the oral and dermal toxicity of HCFC-123 in humans. Studies in animals show that HCFC-123 has low acute oral toxicity (ALD of approximately 9000 mg/kg in rats) and low dermal toxicity (LD50 &gt; 2000 mg/kg in rats and rabbits). In rats and hamsters, the acute inhalation LC50 (four hour) for HCFC-123 is low, 28,000?53,000 ppm (175?330 mg/L). In a single acute inhalation study carried out in guinea pigs, hepatotoxicity was seen at the lowest test level of 1000 ppm (6.25 mg/L) HCFC-123. Similar lesions were described in the same study with the HCFC-123 analogue, halothane. Such lesions were reported as reversible (by one week post-exposure) in other studies on halothane exposed guinea pigs. Halothane is associated with both fatal (rare) and non-fatal hepatitis in humans. Acute reversible CNS effects have been reported in humans and animals following inhalation of HCFC-123. Exposure levels were not categorised in cases of human poisoning. No CNS effects were seen at 2500 ppm (15.6 mg/L) HCFC-123 in a behavioural study in rats. CFCs and HCFCs are known to sensitise the heart to adrenalin-induced arrhythmias. HCFC-123 caused cardiac sensitisation in dogs exposed to levels around 20,000 ppm (125 mg/L), whereas no effects were seen at 10,000 ppm (62.5 mg/L). Although no data were available on cardiac sensitisation effects for HCFC-123 in humans, such effects have been documented following exposure to other CFCs, including CFC-12, where sensitisation was reported at 10,000 ppm. In humans, liver toxicity, cardiac sensitisation and CNS depression are likely to be the critical effects following acute exposure to HCFC-123, although asphyxiation may also occur at very high levels. Tests in rabbits and guinea pigs indicate that HCFC-123 is not a skin irritant. 12,64 HCFC-123 was a slight eye irritant in rabbits. A study on skin sensitisation of HCFC-123, carried out in guinea pigs, was considered negative under the conditions of the study. It is possible that the doses used may not have been sufficiently high to elicit a sensitisation response. However, sensitisation has not been reported in other structural analogues of HCFC-123. There are no reports of adverse effects in humans following repeated or prolonged exposure to HCFC-123. In humans, repeated exposure to other CFCs and HCFCs have been associated with haematological effects, neurological disorders, liver damage, reproductive effects and coronary heart disease. neurotoxicity at the highest exposure (inhalation) level of 5000 ppm. A NOAEL for CNS (anaesthetic) effects in rats and Human liver toxicity has been well documented for structural analogues of HCFC-123 including halothane, which has a similar metabolic, immunological and hepatotoxic profile to HCFC-123 in animal studies. Adverse hepatic effects were seen in rats, guinea-pigs and dogs following repeated exposure (inhalation) to HCFC-123. The types of lesions observed varied between species and with duration of study. Generally, the lesions observed were hepatocyte enlargement and vacuolation (at 300 ppm) with necrosis and fatty change (at and above 1000 ppm). Such lesions were reported as reversible (30 days post-exposure) in a single 90-day study in rats exposed to 500?5000 ppm HCFC-123 and were not significantly increased at 300 ppm after 12 months in the two-year inhalation study.</p>
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Acute Toxicity	✘	Carcinogenicity	✔
Skin Irritation/Corrosion	⊖	Reproductivity	⊖
Serious Eye Damage/Irritation	⊖	STOT - Single Exposure	⊖
Respiratory or Skin sensitisation	⊖	STOT - Repeated Exposure	✔
Mutagenicity	⊖	Aspiration Hazard	⊖

**Legend:** ✘ – Data available but does not fill the criteria for classification  
 ✔ – Data available to make classification  
 ⊖ – Data Not Available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

R123	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available

Continued...



R123

R123	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	55.5mg/L	2
	EC50	48	Crustacea	17mg/L	5
	EC50	96	Algae or other aquatic plants	68mg/L	5
	NOEC	48	Crustacea	<2.24mg/L	2

**Legend:** Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

**DO NOT discharge into sewer or waterways.**

[Acute ecotoxicity:]. Fishes, Salmo gairdneri, LC 50, 96 h, 55.5 mg/l|. Crustaceans, Daphnia magna, EC 50, 48 h, 17.3 mg/l|. Algae, Selenastrum capricornutum, EC 50, 96 h, 96.6 mg/l|Mobility:|. Air, Henrys law constant (H) ca. 3,570 Pa.m<sup>3</sup>/mol|Result: considerable volatility|. Water, evaporation, t 1/2 ca. 23 hour(s)|Conditions: 25 ° C / calculated value|. Soil/sediments, adsorption, log KOC from 1.8 - 2.6|Abiotic degradation:|. Air, indirect photo-oxidation, t 1/2 = 1.18 year(s)|Conditions: sensitiser: OH radicals|Degradations products: trifluoroacetic acid / carbon dioxide / hydrochloric acid/fluorhydric acid|. Air, photolysis, ODP = 0.02|Result: limited effect on stratospheric ozone|Reference value for CFC 11: ODP = 1.|. Air, greenhouse effect, GWP = 0.022|Reference value for CFC 11: GWP = 1.|. Water/soil|Result: non-significant hydrolysis and photolysis|Biotic degradation:|. Aerobic, test: ready biodegradability/closed bottle, degradation = 24 %, 28 day(s)|Result: non-readily biodegradable|. Aerobic, test: biodegradation by methane oxidation|Result: non-biodegradable|Conditions: inoculum: Methylosinus trichosporium OB3b

**Persistence and degradability**

Ingredient	Persistence: Water/Soil	Persistence: Air
R123	HIGH	HIGH

**Bioaccumulative potential**

Ingredient	Bioaccumulation
R123	LOW (LogKOW = 2.1738)

**Mobility in soil**

Ingredient	Mobility
R123	LOW (KOC = 154.4)

**SECTION 13 DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

<b>Product / Packaging disposal</b>	<ul style="list-style-type: none"> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Authority for disposal.</li> <li>▶ Bury or incinerate residue at an approved site.</li> <li>▶ Recycle containers if possible, or dispose of in an authorised landfill.</li> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> <p>Otherwise:</p> <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> </ul>
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**SECTION 14 TRANSPORT INFORMATION**

**Labels Required**

<b>Marine Pollutant</b>	NO
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**Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

## SECTION 15 REGULATORY INFORMATION

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

#### R123(306-83-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Hawaii Air Contaminant Limits	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US AIHA Workplace Environmental Exposure Levels (WEELs)	US TSCA Chemical Substance Inventory - Interim List of Active Substances
US EPCRA Section 313 Chemical List	US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements

### Federal Regulations

#### Superfund Amendments and Reauthorization Act of 1986 (SARA)

##### SECTION 311/312 HAZARD CATEGORIES

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	No
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	Yes
Acute toxicity (any route of exposure)	No
Reproductive toxicity	Yes
Skin Corrosion or Irritation	No
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	No
Specific target organ toxicity (single or repeated exposure)	Yes
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No

#### US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

None Reported

### State Regulations

#### US. CALIFORNIA PROPOSITION 65

None Reported

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (R123)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y

USA - TSCA	Y
<b>Legend:</b>	<i>Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)</i>

## 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.

The 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.

### Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average

PC—STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit.

IDLH: Immediately Dangerous to Life or Health Concentrations

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value

LOD: Limit Of Detection

OTV: Odour Threshold Value

BCF: BioConcentration Factors

BEI: Biological Exposure Index

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