

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

### SECTION 1. IDENTIFICATION

Product name : Freon™ 123 (R-123) refrigerant

Product code : D10115941

SDS-Identcode : 130000024258

#### Manufacturer or supplier's details

Company name of supplier : The Chemours Company FC, LLC

Address : 1007 Market Street  
Wilmington, DE 19899 United States of America (USA)

Telephone : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)

Emergency telephone : Medical emergency: 1-866-595-1473 (outside the U.S. 1-302-773-2000) ; Transport emergency: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

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

Recommended use : Refrigerant

Restrictions on use : For professional and industrial installation and use only.

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with 29 CFR 1910.1200

Specific target organ : Category 3  
systemic toxicity - single  
exposure

#### GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H336 May cause drowsiness or dizziness.

Precautionary Statements : **Prevention:**  
P261 Avoid breathing mist or vapors.  
P271 Use only outdoors or in a well-ventilated area.  
**Response:**  
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version 8.0      Revision Date: 10/17/2018      SDS Number: 1329735-00036      Date of last issue: 05/02/2018  
Date of first issue: 02/27/2017

CENTER/doctor if you feel unwell.

### Storage:

P405 Store locked up.

### Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

### Other hazards

Dangerous for the ozone layer.

Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.

Rapid evaporation of the product may cause frostbite.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance  
Substance name : 2,2-Dichloro-1,1,1-trifluoroethane  
CAS-No. : 306-83-2

### Components

Chemical name	CAS-No.	Concentration (% w/w)
2,2-Dichloro-1,1,1-trifluoroethane	306-83-2	100

## SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
Get medical attention if symptoms occur.

In case of skin contact : In case of contact, immediately flush skin with plenty of water.  
Get medical attention if symptoms occur.

In case of eye contact : Flush eyes with water as a precaution.  
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
Get medical attention if symptoms occur.  
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : May cause cardiac arrhythmia.  
Inhalation of high concentration may cause Anaesthetic effects  
Dizziness  
confusion

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version 8.0	Revision Date: 10/17/2018	SDS Number: 1329735-00036	Date of last issue: 05/02/2018 Date of first issue: 02/27/2017
----------------	------------------------------	------------------------------	---

Light-headedness  
Drowsiness  
Unconsciousness  
Irregular cardiac activity  
fainting  
Weakness  
Skin contact may provoke the following symptoms:  
Irritation  
Discomfort  
Pain  
Swelling of tissue  
Rash  
Itching  
Eye contact may provoke the following symptoms  
Discomfort  
Pain  
Redness  
Impairment of vision  
Adverse effects from repeated inhalation may include  
Liver disorders  
May cause drowsiness or dizziness.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

Notes to physician : Treat symptomatically and supportively.

### SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Not applicable  
Will not burn

Unsuitable extinguishing media : Not applicable  
Will not burn

Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : No hazardous combustion products are known

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

- |   |   |   |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Use personal protective equipment.<br>Follow safe handling advice and personal protective equipment recommendations.  |
| Environmental precautions   | : | Discharge into the environment must be avoided.<br>Prevent further leakage or spillage if safe to do so.<br>Prevent spreading over a wide area (e.g., by containment or oil barriers).<br>Retain and dispose of contaminated wash water.<br>Local authorities should be advised if significant spillages cannot be contained.   |
| Methods and materials for containment and cleaning up               | : | Soak up with inert absorbent material.<br>For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.<br>Clean up remaining materials from spill with suitable absorbent.<br>Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.<br>Sections 13 and 15 of this SDS provide information regarding certain local or national requirements. |

### SECTION 7. HANDLING AND STORAGE

- |                             |   |  |
|-----------------------------|---|--|
| Technical measures          | : | See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.  |
| Local/Total ventilation     | : | Use with local exhaust ventilation.  |
| Advice on safe handling     | : | Do not breathe vapors or spray mist.<br>Do not swallow.<br>Avoid contact with eyes.<br>Avoid prolonged or repeated contact with skin.<br>Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment<br>Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point.<br>Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.<br>Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems.<br>Never attempt to lift cylinder by its cap.<br>Do not drag, slide or roll cylinders.<br>Use a suitable hand truck for cylinder movement.<br>Take care to prevent spills, waste and minimize release to the environment. |
| Conditions for safe storage | : | Cylinders should be stored upright and firmly secured to   |

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version 8.0      Revision Date: 10/17/2018      SDS Number: 1329735-00036      Date of last issue: 05/02/2018  
Date of first issue: 02/27/2017

prevent falling or being knocked over.  
Separate full containers from empty containers.  
Do not store near combustible materials.  
Avoid area where salt or other corrosive materials are present.  
Do not expose drums to direct heat or temperature above 46°C (115°F) to avoid pressurizing and possibly distorting the drums.  
Material should not be dispensed by pouring from pail/drum shipping containers containing 5 gallons or more. The use of a drum pump is recommended for dispensing from pail/drum shipping containers with 5 gallons or more, except for smaller containers where adequate ventilation can be used to manage the exposure.  
Keep in properly labeled containers.  
Store locked up.  
Keep in a cool, well-ventilated place.  
Store in accordance with the particular national regulations.

Materials to avoid : No special restrictions on storage with other products.

Recommended storage temperature : < 126 °F / < 52 °C

Storage period : > 10 y

Further information on storage stability : The product has an indefinite shelf life when stored properly.

### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2,2-Dichloro-1,1,1-trifluoroethane	306-83-2	TWA	50 ppm	US WEEL

**Engineering measures** : Minimize workplace exposure concentrations.  
Use with local exhaust ventilation.

#### Personal protective equipment

**Respiratory protection** : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

---

adequate protection.

Hand protection  
Material

: Low temperature resistant gloves

Remarks

: Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!

Eye protection

: Wear the following personal protective equipment:  
Safety glasses

Skin and body protection

: Skin should be washed after contact.

Hygiene measures

: Ensure that eye flushing systems and safety showers are located close to the working place.  
When using do not eat, drink or smoke.  
Wash contaminated clothing before re-use.

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### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

: liquid

Color

: colorless

Odor

: slight, ether-like

Odor Threshold

: No data available

pH

: 7

Melting point/freezing point

: No data available

Initial boiling point and boiling range

: 82.0 °F / 27.8 °C

Flash point

: does not flash

Evaporation rate

: < 1  
(CCL4=1.0)

Flammability (solid, gas)

: Not applicable

Flammability (liquids)

: Will not burn

Upper explosion limit / Upper flammability limit

: Upper flammability limit  
Method: ASTM E681  
None.

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version 8.0	Revision Date: 10/17/2018	SDS Number: 1329735-00036	Date of last issue: 05/02/2018 Date of first issue: 02/27/2017
----------------	------------------------------	------------------------------	---

Lower explosion limit / Lower flammability limit	:	Lower flammability limit Method: ASTM E681 None.
Vapor pressure	:	913.6 hPa (77 °F / 25 °C)
Relative vapor density	:	5.5
Relative density	:	1.47 (77 °F / 25 °C)
Density	:	1.46 g/cm <sup>3</sup> (77 °F / 25 °C) (as liquid)
Solubility(ies) Water solubility	:	3.9 g/l (77 °F / 25 °C)
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable

### SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	None known.
Conditions to avoid	:	None known.
Incompatible materials	:	None.
Hazardous decomposition products	:	No hazardous decomposition products are known.

### SECTION 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure

Inhalation  
Skin contact

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

Ingestion  
Eye contact

### Acute toxicity

Not classified based on available information.

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Acute oral toxicity	: LD50 (Rat): 9,000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	: LC50 (Rat): 32000 ppm Exposure time: 4 h Test atmosphere: gas  Lowest observed adverse effect concentration (Dog): 20000 ppm Symptoms: Cardiac sensitization  No observed adverse effect concentration (Dog): 10000 ppm Symptoms: Cardiac sensitization  Cardiac sensitisation threshold limit (Dog): 124,000 mg/m <sup>3</sup> Symptoms: Cardiac sensitization
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

### Skin corrosion/irritation

Not classified based on available information.

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Species	: Rabbit
Result	: No skin irritation

### Serious eye damage/eye irritation

Not classified based on available information.

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Species	: Rabbit
Result	: No eye irritation

### Respiratory or skin sensitization

#### Skin sensitization

Not classified based on available information.

#### Respiratory sensitization

Not classified based on available information.



# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

---

### Components:

#### **2,2-Dichloro-1,1,1-trifluoroethane:**

Routes of exposure	: Skin contact
Species	: Guinea pig
Result	: negative

Result	: negative
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### **Germ cell mutagenicity**

Not classified based on available information.

### Components:

#### **2,2-Dichloro-1,1,1-trifluoroethane:**

Germ cell mutagenicity - Assessment	: Weight of evidence does not support classification as a germ cell mutagen.
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### **Carcinogenicity**

Not classified based on available information.

### Components:

#### **2,2-Dichloro-1,1,1-trifluoroethane:**

Carcinogenicity - Assessment	: Weight of evidence does not support classification as a carcinogen, Based on data from similar materials
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<b>IARC</b>	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
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<b>OSHA</b>	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
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<b>NTP</b>	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
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### **Reproductive toxicity**

Not classified based on available information.

### Components:

#### **2,2-Dichloro-1,1,1-trifluoroethane:**

Reproductive toxicity - Assessment	: Weight of evidence does not support classification for reproductive toxicity
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### **STOT-single exposure**

May cause drowsiness or dizziness.

### Components:

#### **2,2-Dichloro-1,1,1-trifluoroethane:**

Assessment	: May cause drowsiness or dizziness.
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# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

### STOT-repeated exposure

Not classified based on available information.

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Assessment	:	No significant health effects observed in animals at concentrations of 1 mg/l/6h/d or less.
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### Repeated dose toxicity

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Species	:	Rat
NOAEL	:	3.13 mg/l
LOAEL	:	6.3 mg/l
Application Route	:	inhalation (vapor)
Exposure time	:	70 d
Remarks	:	No significant adverse effects were reported

### Aspiration toxicity

Not classified based on available information.

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 55.5 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 17.3 mg/l Exposure time: 48 h
Toxicity to algae	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 96.6 mg/l Exposure time: 96 h  EbC50 (Pseudokirchneriella subcapitata (green algae)): 67.8 mg/l Exposure time: 96 h

### Persistence and degradability

### Components:

#### 2,2-Dichloro-1,1,1-trifluoroethane:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 24 % Exposure time: 28 d
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# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

### Bioaccumulative potential

#### Components:

##### 2,2-Dichloro-1,1,1-trifluoroethane:

Bioaccumulation : Bioconcentration factor (BCF): 33

#### Mobility in soil

No data available

#### Other adverse effects

#### Components:

##### 2,2-Dichloro-1,1,1-trifluoroethane:

Ozone-Depletion Potential : 0.02

Where a range of ODPs is indicated, the highest value in that range shall be used for the purposes of the Protocol. The ODPs listed as a single value have been determined from calculations based on laboratory measurements. Those listed as a range are based on estimates and are less certain. The range pertains to an isomeric group. The upper value is the estimate of the ODP of the isomer with the highest ODP, and the lower value is the estimate of the ODP of the isomer with the lowest ODP.

Regulation: UNEP - Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer (Update: 2016-11-23)

Group: Annex C - Group I: HCFCs (consumption and production)

0.02

Includes all isomers of the substance, regardless of whether the isomer is explicitly listed on its own.

Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class II Substances (Update: 2007-07-01)

## SECTION 13. DISPOSAL CONSIDERATIONS

#### Disposal methods

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

## SECTION 14. TRANSPORT INFORMATION

#### International Regulations

UNRTDG

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

Not regulated as a dangerous good

### IATA-DGR

Not regulated as a dangerous good

### IMDG-Code

Not regulated as a dangerous good

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

### Domestic regulation

#### 49 CFR

Not regulated as a dangerous good

## SECTION 15. REGULATORY INFORMATION

### EPCRA - Emergency Planning and Community Right-to-Know

#### CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

#### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

#### SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Specific target organ toxicity (single or repeated exposure)

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:

2,2-Dichloro- 1,1,1- trifluoroethane	306-83-2	100 %
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### US State Regulations

#### Pennsylvania Right To Know

2,2-Dichloro-1,1,1-trifluoroethane	306-83-2
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### International Regulations

Montreal Protocol (Ozone Depleting Substances) : 2,2-Dichloro-1,1,1-trifluoroethane

# SAFETY DATA SHEET



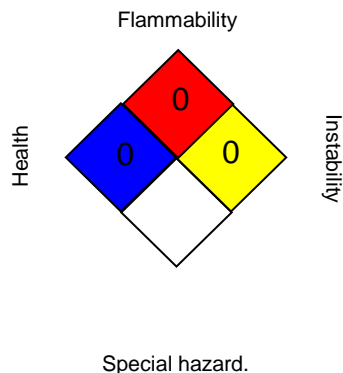
## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

### SECTION 16. OTHER INFORMATION

#### Further information

##### NFPA 704:



##### HMIS® IV:

HEALTH	/	0
FLAMMABILITY		0
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "\*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

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Chemours™ and the Chemours Logo are trademarks of The Chemours Company.

Before use read Chemours safety information.

For further information contact the local Chemours office or nominated distributors.

All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

#### Full text of other abbreviations

US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
US WEEL / TWA	:	8-hr TWA

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of

# SAFETY DATA SHEET



## Freon™ 123 (R-123) refrigerant

Version	Revision Date:	SDS Number:	Date of last issue: 05/02/2018
8.0	10/17/2018	1329735-00036	Date of first issue: 02/27/2017

---

Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 10/17/2018

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8