Safety Data Sheet

R-123

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-123

OTHER NAME: 1,1-Di-chloro-2,2,2-trifluoroethane

USE: Refrigerant Gas

DISTRIBUTOR: ZheJiang BingEr New Type Refrigerant Co., Ltd.
No.28, Zesheng Road,Nianli Industrial Functional Zone, Qujiang Zone,Quzhou City, Zhejiang Province China

TEL: +86-(0)570-2962222

FAX: +86-(0)570-3088229

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Specific Target Organ Toxicity (Central Nervous System) – Single Exposure Category 3

SIGNAL WORD: WARNING

HAZARD STATEMENT: May cause drowsiness or dizziness

SYMBOL: Exclamation Mark

PRECAUTIONARY STATEMENT(S):

PREVENTION: Avoid breathing vapors

RESPONSE: If inhaled move victim to fresh air and keep at rest in a position comfortable for breathing

STORAGE: Store in a well ventilated place. Keep container tightly closed. Store locked up.

DISPOSAL: Dispose of contents/container at an approved disposal facility.

EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material.

Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250 C), decomposition products may include Hydrochloric Acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

SKIN: Prolonged and/or repeated contact with this solvent can cause irritation of the skin (defatting of skin).

EYES: Irritant. Liquid contact will irritate and may cause conjunctivitis.

INHALATION: When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. Overexposure to vapors may cause temporary anesthetic effects such as dizziness, headache and confusion. At higher levels, cardiac arrhythmia may occur.

In repeated exposure tests with animals, changes were noted in liver functions and lipid production at levels above 100 ppm. In isolated incidents with workers, overexposure to solvent vapors resulted in elevated liver enzyme levels. Liver enzyme levels returned to normal after overexposure ceased.

INGESTION: Discomfort due to volatility would be expected. Some of the inhalation effects could be expected.

DELAYED EFFECTS: No delayed effects of a single exposure have been identified. Delayed effects of multiple exposure are seen in animal studies by the formation late developing benign tumors. Repeated overexposure to vapor may result in elevated liver enzyme levels.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section			

3. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
1,1-Dichloro-2,2,2-trifluoroethane	306-83-2	100

COMMON NAME and SYNONYMS R-123; HCFC123

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. Remove clothing contaminated with liquid and wash before use.

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Get medical attention.

INHALATION: Immediately remove patient to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine (adrenaline).

INGESTION: DO NOT induce vomiting unless instructed to do so by a physician. DO NOT give stimulants. Get medical attention immediately.

ADVICE TO PHYSICIAN: Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: None

FLASH POINT METHOD: ASTM D-1310-67 and ASTM D-56-82

AUTOIGNITION TEMPERATURE: 770 C

UPPER FLAME LIMIT (volume % in air): None

LOWER FLAME LIMIT (volume % in air): None

FLAME PROPAGATION RATE (solids): Not applicable

OSHA FLAMMABILITY CLASS: Not applicable

EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

R-123 is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Product will decompose at temperatures above 250 C. Decomposition products include hydrochloric acid, hydrofluoric acid, and carbonyl halides. Contact with certain finely divided metals may cause exothermic reaction and/or explosive combinations.

Solvent vapors, when present in the flammable range (listed above), especially in a confined or poorly ventilated space, can be ignited with a flame or high intensity source of heat.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decomposition.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

Evacuate unprotected personnel and provide maximum ventilation. Protected personnel should eliminate all ignition sources if without risk. Only personnel equipped with proper respiratory and eye/skin protection should be permitted in the area. Dike area to contain the spill. Take precautions as necessary to prevent contamination of ground and surface waters. For large spills, pump solvent into appropriate containers. For small spills, recover or absorb spilled material using an absorbent designed for chemical spills such as Hazsorb® pillows. Place used absorbents into closed DOT approved containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush into sewer. If the area of the spill is porous, removal of contaminated earth/surface may be required.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

R-123 boils at 82.2 F, hence contents may be under pressure. Exercise caution when opening container. If containers have been stored in direct sunlight or heated above the boiling point of the solvent, the container should be cooled to below the boiling point before opening.

R-123 should not be mixed with air above atmospheric pressure for leak testing or any other purpose. See Section 5: Unusual Fire and Explosion Hazards.

Recommended Opening Procedure

To open container, follow these procedures to avoid loss and contamination of the product.

1. Tear off protective cap over large bun opening.

2. Carefully remove the ¾ inch plug from the center of the large bung. DO NOT puncture the inner seal.
3. Insert convenient length ¾ inch nipple fitted with a closed valve. As nipple is inserted, the inner seal is broken and container is ready to unload through valve

STORAGE RECOMMENDATIONS:

Keep container closed when not in use. DO NOT store in open, unlabeled or mislabeled containers. Store in a cool, well-ventilated area of low fire risk. Protect container and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty. If container temperature exceeds boiling point, cool the container before opening

INCOMPATIBILITIES: Alkali metals. Alkaline earth metals. Powdered metals. Powdered metal salts.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Use local exhaust at filling zones and areas where leakage is probable. Use mechanical (general) ventilation for storage areas. All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Concentration of R-123 should be monitored and kept below the recommended levels in work areas.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Use protective, impervious gloves and apron constructed of butyl rubber (2nd choice: viton or neoprene), if prolonged or repeated contact with liquid is anticipated. Any non-impervious clothing should be promptly removed when contaminated and washed before reuse.

EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear splash-proof goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. Where concentrations are above the recommended (* Workplace Environmental Exposure Level of 50 ppm TWA), use NIOSH-approved organic vapor canister respirator. For large spills or non-ventilated situations where concentrations are significantly above the recommended TLV, use a NIOSH-approved supplied air respirator.

ADDITIONAL RECOMMENDATIONS:

High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER
LIMIT Dichlorotrifluoroethane	None	None	* 50 ppm TWA

* = Workplace Environmental Exposure Level (AIHA)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV – 0.5ppm, 2ppm ceiling

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless liquid
PHYSICAL STATE: Liquid
MOLECULAR WEIGHT: 152.9
CHEMICAL FORMULA: $CHCl_2CF_3$
ODOR: Faint ethereal and sweetish odor
SPECIFIC GRAVITY (water = 1.0): 1.47 @ 70 F (21.1 C)
SOLUBILITY IN WATER (weight %): 0.21% @ 70 F (21.1 C)
pH: Neutral

BOILING POINT: 82.2 F (27.9 C)

MELTING POINT: -107 C (-160.6 F)
VAPOR PRESSURE: 11.4 psia (-6.7 in Hg vacuum) @ 70 F (21.1 C)
35.2 psia (20.5 psig @ 54.4 C 130 F)
VAPOR DENSITY (air = 1.0): 5.3
EVAPORATION RATE: >1 **COMPARED TO:** Ether = 1
% VOLATILES: 100 **FLASH POINT:** None
(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is normally stable.
Avoid sources of ignition such as sparks, hot spots, welding flames and lighted cigarettes or unit heaters to prevent formation of toxic and/or corrosive by-products. Avoid mixing with air or oxygen above atmospheric pressure.

INCOMPATIBILITIES:

Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically active metals for example sodium, potassium, calcium, magnesium, zinc, or powdered aluminum.

HAZARDOUS DECOMPOSITION PRODUCTS:

Hydrochloric and hydrofluoric acids; and carbonyl halides, such as phosgene.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC_{50} – 4 hr. (rat) : 32,000 ppm / Cardiac sensitization threshold (dog): 20,900 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Chronic (rat):
At 300 ppm and above, benign testicular tumors developed in a statistically significant number of male animals at or near the end of the study. At 1000 ppm and above, benign pancreatic tumors were also seen in males. Retinal atrophy was increased in the test animals. Liver tumors were found in test animals at concentrations at and above 300 ppm. None of the effects were life threatening or life shortening.

OTHER DATA:

No reproductive effects were seen in a two-generation, inhalation reproduction study although a retarded rate of weight gain and lower pup weights were noted. These effects were seen at inhalation concentrations above 30 ppm for animals exposed throughout the test. A follow-up Cross Fostering study confirmed that these body weight gain effects were the direct result of exposure of the pups to either HCFC-123 or its metabolite, Trifluoroacetic acid, through the maternal milk and not a reproductive or developmental effect.

Six genetic assays were run, five of which were negative. The sixth, chromosome aberration of human lymphocytes, was weakly positive.

Teratology (rat) – Not teratogenic at 10,000 ppm
Teratology (rabbit) – Not teratogenic at 5,000 ppm

In isolated instances, some workers overexposed to HCFC-123, were found to have elevated liver enzymes. The liver enzyme levels returned to normal when the worker overexposure ceased.