

MATERIAL SAFETY DATA SHEET

R-22

Issue Date: 2nd February 2020

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-22

OTHER/GENERIC NAMES: Chlorodifluoromethane

PRODUCT USE: Refrigerant

SUPPLIER: Dynaflo Co. Ltd., Nana Bhai Lane Fort,
Mumbai - 400 001, India

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS #	WEIGHT %	COMMON NAME
Chlorodifluoromethane	75-45-6	100	HCFC-22

3. HAZARDS IDENTIFICATION



EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Nonflammable 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 such as phosgene.

POTENTIAL HEALTH HAZARDS:

SKIN: Irritation would result from a defatting action on tissue. Liquid contact with skin could cause frostbite.

EYES: Liquid contact can cause frostbite, which may be severe. Mist may irritate.

INHALATION: R-22 exhibits low toxicity in animals. However, when oxygen levels are reduced to 12-14% by displacement symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.



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INGESTION: Ingestion is an unlikely route of exposure because of its low boiling point. Should it occur, discomfort in the gastrointestinal tract would result from the rapid evaporation of the liquid. Necrosis from freezing of tissue could occur.

DELAYED EFFECTS: None known

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

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

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (don't rub) with lukewarm (not hot) water. In the absence of water, cover with clean, soft wool or similar covering. Call a physician.

EYE: Immediately flush with large amounts of water for at least 15 minutes (in case of frostbite, water should be lukewarm - not hot), lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INHALATION: Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Call a physician. Do not give epinephrine (adrenaline).

INGESTION: Ingestion is an unlikely route of exposure and is not likely to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

ADVICE TO PHYSICIAN: Because of possible disturbances of cardiac rhythm, catecholamine drugs such as epinephrine, should be used with special caution 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:	N.A. - No flash point.
FLASH POINT METHOD:	ASTM D-1310-67 and ASTM D-56-82
AUTOIGNITION TEMPERATURE:	Unknown
UPPER FLAME LIMIT (Volume % in air):	None.



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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-22 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. Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g., very high temperatures and/or appropriate pressures).

SPECIAL FIREFIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool and to suppress vapors.

6. ACCIDENTAL RELEASE MEASURES

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

Evacuate all unprotected personnel. Protected personnel should remove any ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas.

7. HANDLING AND STORAGE

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

Avoid breathing vapors or liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized containers only. Follow standard safety precautions for handling and use of cylinders of compressed gases. R-22 should not be mixed with air above atmospheric pressure for leak testing or any other purpose. See Section 5: Unusual Fire and Explosion Hazards.

STORAGE RECOMMENDATIONS:

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 and replace bung after use and when empty.



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7. HANDLING AND STORAGE

ENGINEERING CONTROLS:

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse. **EYE PROTECTION:** For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. 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
Chlorodifluoromethane	1000 ppm TWA (8hr)	1000 ppm TWA (8hr)	None

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV = 2ppm ceiling, 0.5ppm TLV-TWA

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9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear colorless liquid and vapor.
PHYSICAL STATE:	R-22 is a gas at normal temperatures.
MOLECULAR WEIGHT:	86.45
CHEMICAL FORMULA:	CHClF ₂
ODOR:	Faint ethereal odor.
SPECIFIC GRAVITY:	(Water = 1.0) 1.21 @ 21.1°C (70°F)
SOLUBILITY IN WATER:	(Weight %) 0.3 WT%@25°C and 1 atmosphere
PH:	Neutral
BOILING POINT:	-40.8°C (-41.40°F) C @ 760 MM Hg
MELTING POINT:	-160°C (-256°F)
VAPOR PRESSURE:	136.1 psia 21.1°C (70°F)
VAPOR DENSITY:	(Air = 1.0) 3.0
EVAPORATION RATE:	Greater than 1 Compared to: CC14
% VOLATILES:	% Volatiles by volume @ 20°C (68°F) = 100
FLASH POINT:	N.A. - No flash point.

(Flash point method and additional flammability data are found in section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE: (Conditions to Avoid)

The product is stable. Avoid any source of ignition, such as lighted cigarettes, flames, hot spots welding. May yield toxic and/or corrosive decomposition products. Avoid mixing with air or oxygen above atmospheric pressure.

INCOMPATIBILITIES:

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

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids, and possibly carbonyl halides. These are toxic and corrosive.

HAZARDOUS POLYMERIZATION:

Will not occur.



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11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC50 - 4 hour (rat): Greater than or equal to 300,000 ppm
Cardiac Sensitization Threshold - 50,000 ppm

DELAYED (SUBCHRONIC & CHRONIC) EFFECTS:

Subchronic: NOEL - 10,000 ppm
Not teratogenic
Not Mutagenic in in-vitro and in-vivo test.

OTHER DATA:

Lifetime exposure of male rats was associated with a small increase in salivary gland fibrosarcomas

12. ECOLOGICAL INFORMATION

Degradability (BOD): Not pertinent.
Octanol Water Partition Coefficient: Unknown

13. DISPOSAL CONSIDERATIONS

RCRA:

Is the unused product a RCRA hazardous waste if discarded? Not a hazardous Waste.
If yes, the RCRA ID number is: Not applicable

OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local disposal or discharge laws. Disposal of waste R-22 (Chlorodifluoromethane) is subject to federal regulations. Users should review their operations, then consult with appropriate regulatory agencies before discharging or disposing of waste material. Disposal by a licensed waste disposal company may be necessary.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION



US DOT HAZARD CLASS: Chlorodifluoromethane (R-22)



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US DOT HAZARD CLASS: 2.2
US DOT ID NUMBER: UN1018

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Listed on the TSCA inventory
OTHER TSCA ISSUES: None

SARA TITLE III / CERCLA

“Reportable Quantities” (RQs) and/or “Threshold Planning Quantities” (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA / CERCLA RQ (lb.)	SARA EHS TPQ (lb.)
No ingredients listed in this section		

SECTION 311 HAZARD CLASS: IMMEDIATE PRESSURE

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 “Toxic Chemicals”. CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
Chlorodifluoromethane (HCFC-22)	None

16. OTHER INFORMATION

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0
ANSI/ASHRAE 34 Safety Group – A1
UL Classified