



MATERIAL SAFETY DATA SHEET

R-22 (CHLORODIFLUOROMETHANE)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name : FLORON 22

TRADE NAMES/SYNONYMS: Freon 22 ,m FLUOROCARBON 22, REFRIGERANT 22, PROPELLANT 22, CHLORODIFLUOROMETHANE

Substance : CHC1F2

CHEMICAL FAMILY: FLUOROCARBONS

Product Use : Refrigerant, Foam blowing agent, Aerosol

Manufacturers: SRF Ltd. Chemicals Business
V&PO: JHIWANA, Tehsil. TIJARA, Dist. - ALWAR,
RAJASTHAN, INDIA
Pin Code-301019

EMERGENCY CONTACT: (24 Hours/Day, 7 Days/Week)
Mr. Himanshu Shukla
+91 – (01493) 517838, 517839

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: Chlorodifluoromethane

CAS NUMBER: 75-45-6

UN No. : 1018

PERCENTAGE: 99.9

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=0 REACTIVITY=1

EMERGENCY OVERVIEW:

SRF LIMITED

Block-C, Sector-45

Gurgaon 122 003

Haryana, India

Tel: +91-124-4354400

Fax: +91-124-4354500

Website: www.srf.com

Regd. Office:

C-8 Commercial Complex

Safdarjung Development Area

New Delhi – 110 016, India

COLOR: colorless

PHYSICAL FORM: gas

ODOR: Ethereal and faint sweetish odor.

MAJOR HEALTH HAZARDS : Overexposure may cause dizziness and loss of concentration.

PHYSICAL HAZARDS: At higher temperatures, (>250°C), decomposition products may include Hydrochloric Acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH EFFECTS:

INHALATION: Floron 22 is low in acute toxicity in animals. 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. At high levels, cardiac arrhythmia may occur.

SHORT TERM EXPOSURE: frostbite

LONG TERM EXPOSURE: No information is available

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

SHORT TERM EXPOSURE: frostbite

LONG TERM EXPOSURE: no information is available

EYE CONTACT: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: no information is available

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

SHORT TERM EXPOSURE: No information on significant adverse effects

LONG TERM EXPOSURE: No information is available

4. FIRST AID MEASURES

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

SRF LIMITED

Block-C, Sector-45

Gurgaon 122 003

Haryana, India

Tel: +91-124-4354400

Fax: +91-124-4354500

Website: www.srf.com

Regd. Office:

C-8 Commercial Complex

Safdarjung Development Area

New Delhi – 110 016, India



SKIN CONTACT: . Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYE CONTACT: Immediately flush eyes 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.

INGESTION: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

NOTE 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

FLASH POINT: Gas, not applicable per DOT regulations

FLASH POINT METHOD: Not applicable

AUTOIGNITION TEMPERATURE: Unknown

FIRE AND EXPLOSION HAZARDS:

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:

Floron -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 FIRE FIGHTING 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.

6. ACCIDENTAL RELEASE MEASURES

SRF LIMITED

Block-C, Sector-45

Gurgaon 122 003

Haryana, India

Tel: +91-124-4354400

Fax: +91-124-4354500

Website: www.srf.com

Regd. Office:

C-8 Commercial Complex

Safdarjung Development Area

New Delhi – 110 016, India

OCCUPATIONAL RELEASE:

(Always wear recommended personal protective equipment.)

Evacuate unprotected personnel. Protected personnel should remove 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

STORAGE: Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

HANDLING : Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders. Floron 22 should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER
Chlorodifluoromethane	1000 ppm TWA (8hr)	1000 ppm TWA (8hr)	None

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 the 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:

SRF LIMITED

Block-C, Sector-45
Gurgaon 122 003
Haryana, India
Tel: +91-124-4354400
Fax: +91-124-4354500
Website: www.srf.com

Regd. Office:
C-8 Commercial Complex
Safdarjung Development Area
New Delhi – 110 016, India



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.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Gas

APPEARANCE: Clear, colorless liquid and vapor

COLOR: Colorless

ODOR: Faint ethereal odor

MOLECULAR WEIGHT: 86.45

MOLECULAR FORMULA: CHClF₂

BOILING POINT: -40.8°C (-41.40°F)

FREEZING POINT: -160°C (-256°F)

VAPOR PRESSURE: 136.1 psia @ 70°F, 311.4 psia @ 130°F

VAPOR DENSITY (air=1): 3.0

SPECIFIC GRAVITY: 1.21 @ 21.1°C (70°F)

DENSITY: NA

WATER SOLUBILITY: 0.3 wt% @ 25°C and 1 atmosphere

PH: Neutral

VOLATILITY: 100%

ODOR THRESHOLD: Not available

EVAPORATION RATE: > 1 as compare to CCl₄ =1

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

SRF LIMITED

Block-C, Sector-45
Gurgaon 122 003
Haryana, India
Tel: +91-124-4354400
Fax: +91-124-4354500
Website: www.srf.com

Regd. Office:
C-8 Commercial Complex
Safdarjung Development Area
New Delhi – 110 016, India

10. STABILITY AND REACTIVITY

NORMALLY STABLE (CONDITIONS TO AVOID):

The product is stable.

Do not mix with oxygen or air above atmospheric pressure. Any source of high temperature, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES:

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically active metals: potassium, calcium, powdered aluminum, magnesium and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC50 : 4 hr. (rat) - >300,000 ppm

Cardiac Sensitization threshold (dog) – 50,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Sub chronic inhalation (rat) NOEL - 10,000 ppm

Not teratogenic

Not mutagenic in *in-vitro* or *in-vivo* tests

OTHER DATA:

Lifetime exposure of male rats was associated with a small increase in salivary gland fibro sarcomas.

12. ECOLOGICAL INFORMATION

Degradability (BOD): Floron 22 is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient: Unknown.

SRF LIMITED

Block-C, Sector-45

Gurgaon 122 003

Haryana, India

Tel: +91-124-4354400

Fax: +91-124-4354500

Website: www.srf.com

Regd. Office:

C-8 Commercial Complex

Safdarjung Development Area

New Delhi – 110 016, India

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. Floron 22 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

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: US DOT PROPER SHIPPING NAME: Chlorodifluoromethane

US DOT HAZARD CLASS: 2.2

US DOT PACKING GROUP: Not applicable

US DOT ID NUMBER: UN1018

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

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

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: IMMEDIATE

SRF LIMITED

Block-C, Sector-45
Gurgaon 122 003
Haryana, India
Tel: +91-124-4354400
Fax: +91-124-4354500
Website: www.srf.com

Regd. Office:
C-8 Commercial Complex
Safdarjung Development Area
New Delhi – 110 016, India



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

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section		

ADDITIONAL REGULATORY INFORMATION:

Floron 22 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

WARNING:

Do Not vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

Contains Chlorodifluoromethane, an HCFC substance which harms public health and the environment by destroying ozone in the upper atmosphere. Destruction of the ozone layer can lead to increased ultraviolet radiation which, with excess exposure to sunlight, can lead to an increase in skin cancer and eye cataracts.

WHMIS CLASSIFICATION (CANADA):

This product has been evaluated in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

Canada – Listed on DSL
EU – EINECS # 2008719

SRF LIMITED

Block-C, Sector-45
Gurgaon 122 003
Haryana, India
Tel: +91-124-4354400
Fax: +91-124-4354500
Website: www.srf.com

Regd. Office:
C-8 Commercial Complex
Safdarjung Development Area
New Delhi – 110 016, India

16. OTHER INFORMATION

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

SRF LIMITED

Block-C, Sector-45
Gurgaon 122 003
Haryana, India
Tel: +91-124-4354400
Fax: +91-124-4354500
Website: www.srf.com

Regd. Office:
C-8 Commercial Complex
Safdarjung Development Area
New Delhi – 110 016, India