



BEST INC. LIMITED

ROOMS 1318-20 13/F HOLLYWOOD PLAZA, 610 NATHAN ROAD, MONGKOK, KOWLOON, HONG KONG

MATERIAL SAFETY DATA SHEET

R22

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To: MIDBOURG INVESTMENT LDA
AV. PEDRO CASTRO VAN DUNEM LOY,
S/N, LUANDA, ANGOLA

Invoice No.: 20180525
Date: JUL.09,2018

By Vessel: MSC MARGRIT - FY827A
From: NINGBO, CHINA

Sales Contract No.: BEST20180525
To: LUANDA, ANGOLA

1. Chemical Product Identification

Material Identification CAS Number: 75-45-6 Formula: CHCLF2 Molecular Weight: 86.47

Tradenames and Synonyms: HCFC-22, Chlorodifluoromethane

2. Composition/Information On Ingredients

Components Material METHANE, CHLORODIFLUORO CAS Number% 75-45-6 100%

3. Potential Health Effects

INHALATION: R-22- Inhalation may include temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. High concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air.

SKIN CONTACT: R-22- May include frostbite. Prolonged overexposure may cause defatting or dryness of the skin.

EYE CONTACT: R-22- May include eye irritation with discomfort, tearing, or blurring of vision.

ADDITIONAL HEALTH EFFECTS: R-22- Liquid contact can cause frostbite. Higher exposures may lead to temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality may occur from gross overexposure. Individuals with preexisting diseases of the central nervous, or cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

CARCINOGENICITY INFORMATION: None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.



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4. First Aid Measures

INHALATION: If inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. **SKIN CONTACT:** In case of contact, flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION: Ingestion is not considered a potential route of exposure.

NOTES TO PHYSICIANS: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: Flash Point: Will not burn Autodecomposition: 632 °C (1170 °F)

OTHER BURNING MATERIALS: May cause R-22 to burn weakly. R-22 is not flammable at ambient temperatures and atmospheric pressure. However, R-22 has been shown in tests to be combustible at pressures as low as 60 psig at ambient temperature when mixed with air at concentrations of 65 volume % air. Experimental data have also been reported which indicate combustibility of R-22 in the presence of certain concentrations of chlorine.

FIRE AND EXPLOSION HAZARDS: Cylinders may rupture under fire conditions. Decomposition may occur.

EXTINGUISHING MEDIA: As appropriate for combustibles in area. Extinguishing agent for other burning material in area is sufficient to stop burning.

FIRE FIGHTING INSTRUCTIONS: Use water spray or fog to cool containers. Self-contained breathing apparatus (SCBA) is required if cylinders rupture or contents are released under fire conditions. Water runoff should be contained and neutralized prior to release.

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6. Accidental Release Measures

SAFEGUARDS (PERSONNEL): NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

ACCIDENTAL RELEASE MEASURES: Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills or releases.

7. Handling And Storage

HANDLING (PERSONNEL): Use with sufficient ventilation to keep employee exposure below recommended limits. R-22 should not be mixed with air for leak testing. In general, it should not be used or allowed to be present with high concentrations of air above atmospheric pressure. Contact with chlorine or other strong oxidizing agents should also be avoided.

8. Exposure Controls/Personal Protection

ENGINEERING CONTROLS: Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

PERSONAL PROTECTIVE EQUIPMENT: Impervious gloves and chemical splash goggles should be used when handling liquid. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

EXPOSURE GUIDELINES: Exposure Limits:
PEL (OSHA): None Established
TLV (ACGIH): 1,000 ppm, 3,540 mg/m³, 8 Hr. TWA, A4

9. Physical And Chemical Properties

PHYSICAL DATA:

Boiling Point: -40.8° C (-41.4° F)

Vapor Pressure: 151 psig @ 25° C (77° F)

Vapor Density: 3.03 (Air=1.0) @ 25° C (77° F)

% Volatiles: 100 WT%

Evaporation Rate: >1 (CCl₄=1.0)

Solubility in Water: 0.3 WT% @ 25° C (77° F)

PH: Neutral

Odor: Slight ethereal

Form: Liquified Gas.

Color: Clear, Colorless.

Liquid Density: 1.194 g/cm³ @ 25° C (77° F)



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10. Stability And Reactivity

CHEMICAL STABILITY: Material is stable. However, avoid open flames and high temperatures.

CONDITIONS TO AVOID: Incompatible with alkali or alkaline earth metals--powdered Al, Zn, Be, etc.

DECOMPOSITION: Decomposition products are hazardous. R-22 can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides. These materials are toxic and irritating. Contact should be avoided.

POLYMERIZATION: Polymerization will not occur.

11. Toxicological Information

ANIMAL DATA: R-22

EYE/SKIN IRRITANT: The compound is a skin irritant and a slight eye irritant, but is not a skin sensitizer in animals.

INHALATION: 4 hour, LC50, rat: 220,000 ppm. Effects from single high exposures include central nervous system depression, anesthesia, rapid breathing, lung congestion and microscopic liver changes. Cardiac sensitization occurred in dogs at 50,000 ppm or greater from the action of exogenous epinephrine. No toxic effects or abnormal histopathological observations occurred in rats repeatedly exposed to concentrations ranging from 10,000 to 50,000 ppm (v/v). Long-term exposures to 50,000 ppm (v/v) of vapors produced organ weight increases and a decrease in body weight gain, but no increased mortality or adverse hematological effects. In chronic inhalation studies, R-22, at a concentration of 50,000 ppm (v/v), produced a small, but statistically significant increase of late-occurring tumors involving salivary glands in male rats, but not female rats or male or female mice. In the same studies, no increased incidence of tumors was seen in either species at concentrations of 10,000 ppm or 1,000 ppm (v/v).

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS: Long-term administration in corn oil produced no effects on body weight or mortality. R-22 was mutagenic in some strains of bacteria in bacterial cell cultures, but not mammalian cell cultures or animals. It did not cause heritable genetic damage in mammals. A slight, but significant increase in developmental toxicity was observed at high concentrations (50,000 ppm) of R-22, a concentration which also produced toxic effects in the adult animal. Based on these findings, and other negative developmental studies, R-22 is not considered a unique hazard to the conceptus. Studies of the effects of R-22 on male reproductive performance have been negative. Specific studies to evaluate the effect on female reproductive performance have not been conducted, however, limited information obtained from studies Of developmental toxicity do not indicate adverse effects on female reproductive performance at concentrations up to 50,000 ppm.

12. Ecological Information

ECOTOXICOLOGICAL INFORMATION:

Aquatic Toxicity: 48 hour EC50 - Daphnia magna: 433 mg/L

13. Disposal Considerations

WASTE DISPOSAL: Comply with Federal, State, and local regulations. Reclaim by distillation or remove to a permitted waste disposal facility.

14. Transportation Information

SHIPPING INFORMATION:

Proper	Shipping	Name:	Chlorodifluoromethane
Hazard Class:	2.2	UN No: 1018	DOT/IMO Label: Non-Flammable Gas



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Shipping Containers: Cylinders, Tank Trucks, Tank Cars, Ton tanks.

15. Regulatory Information

U.S. FEDERAL REGULATIONS

TSCA Inventory Status: Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute: Yes Chronic: No Fire: No Reactivity: No Pressure: Yes

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: No CERCLA Hazardous Substance: No SARA Toxic Chemical: See Components Section

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Authorized Signature(s)

16. Other Information

NFPA, NPCA-HMIS

NPCA-HMIS Rating Health: 1 Flammability: 0 Reactivity: 1 Personal Protection: Rating to be supplied by user depending on use conditions.