

# MATERIAL SAFETY DATA SHEET

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## 1. Chemical Product and Company Identification 254

### ARCTON® 22

General Use: Refrigerant

Alternate names: Fluorocarbon 22, R22, FC22, HCFC22

INEOS Fluor Americas LLC  
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St. Gabriel, LA 70776 \*\*\*

Issue Date: 12/31/01  
Rev. 14  
BPCS: 254

Medical Emergency (24 hr.): 800-298-9164  
Transportation emergency (24 hr.): CHEMTREC 800-424-9300  
Product Information: 800-275-5532

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## 2. Composition Information on Ingredients

<u>Ingredients</u>	<u>% (Wt)</u>	<u>ACGIH TLV-TWA &amp; OSHA PEL</u>
Chlorodifluoromethane (CAS 75-45-6)	100	1,000 ppm v/v for 8 hr./day & 40 hr./wk.

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## 3. Hazards Identification

Emergency Overview:

Appearance: Colorless liquified gas with faint ethereal odor

Physical hazards: Compressed liquified gas

Health hazards: Harmful (central nervous system depression, cardiac arrhythmias)

\*Hazard summary (as defined by OSHA Hazard Comm. Std., 29 CFR 1910.1200):

Potential Health Effects:

General: The health hazard assessment is based on toxicity studies together with information from a search of the scientific literature.

Ingestion: Extremely unlikely to occur in use.

Eye contact: Liquid splashes or vapor spray may cause freeze burns.

Skin contact: The liquid form of this product may cause freeze burns (frostbite-like lesions).

Skin absorption: This product will probably not be absorbed through human skin.

Inhalation: Exposures to very high vapor concentrations can induce anesthetic effects progressing from dizziness, weakness, nausea, to unconsciousness. It can act as asphyxiant by limiting available oxygen. Very high doses can cause abnormal heart rhythm which is potentially fatal.

Other effects of overexposure: None expected.

## 4. First Aid Measures

**Skin:** Thaw affected area with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If symptoms (irritation or blistering) develop, get medical attention.

**Eyes:** Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Have eyes examined and treated by medical personnel.

**Ingestion:** Not applicable.

**Inhalation:** Remove victim to fresh air. Keep warm and at rest. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. In the event of cardiac arrest, apply external cardiac massage. Do not administer adrenaline or similar sympathomimetic drugs as cardiac arrhythmias may result. Get immediate medical attention.

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## 5. Fire Fighting Measures

**Flashpoint and method:** Does not flash

**Autoignition temperature:** Not applicable

**Flammable limits (STP):** Nonflammable.

**General hazards:** Compressed liquefied gas. Heavy vapors can suffocate. Under conditions of high pressure, certain HCFC22/air mixtures were shown to be flammable. Mixtures of HCFC22 and air or oxygen should not be used for pressure or leak testing. Thermal decomposition will evolve toxic and irritant vapors. Certain mixtures of HCFC22 and chlorine may be flammable under some conditions.

**Firefighting instructions:** Not applicable. Use media suitable for surrounding fire. Use water spray to cool containers.

**Firefighting equipment:** Self-contained breathing apparatus with full facepiece and protective clothing.

**Hazardous combustion products:** Highly toxic decomposition products.

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## 6. Accidental Release Measures

Precautions should take into account the severity of the leak or spill. For large releases: Use recommended personal protection and evacuate unprotected personnel. Shut off the leak if without risk. Ventilate the spill area. If possible, dike and contain spillage. Prevent liquid from entering sewers, sumps or pit areas since vapor can create a suffocating atmosphere. Capture material for recycle or destruction if suitable equipment is available.

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## 7. Handling and Storage

**Storage temperature:** Keep at temperature not exceeding 120 deg. F. (49 deg C.).

**Storage:** Store in a cool area with good ventilation. Keep containers dry. Keep away from direct sunlight, heat and sources of ignition.

Handling: Avoid causing and inhaling high concentrations of vapor. Atmospheric levels must be controlled to below the OSHA PEL and kept as low as practicable. Do not put mixtures of HCFC22 and oxygen under pressure; do not use such mixtures for leak or pressure testing.

Avoid HCFC22 contact with flames or very hot surfaces.

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## 8. Exposure Controls/Personal Protection

Exposure Guidelines: The ACGIH TLV and OSHA PEL for chlorodifluoromethane are 1,000 ppm v/v as for 8-hour day. Exposures should be kept as low as reasonably practicable below the TLV.

Engineering controls: Ventilate low-lying areas such as sumps or pits where dense vapors collect. Use ventilation adequate to maintain safe levels. Provide eyewash station in work area.

Respiratory protection: Not normally needed if controls are adequate. If needed, use MSHA-NIOSH approved respirator for organic vapors. For high concentrations and oxygen-deficient atmospheres, use positive pressure air-supplied respirator.

Eye protection: Chemical tight goggles; full faceshield in addition if splashing is possible.

Protective clothing: Impervious gloves if any possibility of skin contact with liquid. Additional protection may be required such as apron, arm covers, or full body suit, depending upon conditions.

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## 9. Physical and Chemical Properties

Appearance: Colorless liquified gas with faint ether-like odor

Boiling point: -41.4 deg. F., -40.8 deg C.

Vapor pressure (mmHg at 20 deg. C.): 6800

Vapor density (air = 1): 4.7

Solubility in water: 0.3%

pH: Not applicable

Specific gravity: 1.5 at 4 deg. C.

%Volatile by volume: 100

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## 10. Stability and Reactivity

Stability: Stable under normal conditions.

Incompatibility: Reacts violently with sodium, potassium and barium metal. Reacts with finely divided aluminum, zinc and magnesium, especially at high temperatures.

Hazardous decomposition products: Halogen, halogen acids, possible trace amounts of carbonyl halide.

Hazardous Polymerization: Will not occur.

## 11. Toxicological Information

### Possible Human Health Effects:

**Inhalation:** High atmospheric concentrations may lead to anesthetic effects, including loss of consciousness. Very high exposures may cause an abnormal heart rhythm and prove suddenly fatal. Higher concentrations may cause asphyxiation due to reduced oxygen content of the atmosphere.

**Skin contact:** Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.

**Eye contact:** Liquid splashes or spray may cause freeze burns.

**Ingestion:** Highly unlikely, but should this occur, freeze burns will result.

### Animal data:

The inhalation LC50 in rats was 220,000ppm.

Because of volatility, meaningful tests of skin or eye irritancy, or skin sensitization are not possible.

The threshold for cardiac sensitization (arrhythmias) in dogs pretreated with epinephrine was an atmosphere of 50,000ppm.

No effect of any kind was seen in 90 day inhalation studies in the rat and dog at exposure concentrations of up to and including 10,000ppm.

In the rat, a number of developmental toxicity studies have suggested a link between exposure to chlorodifluoromethane and defects of the eye (micro- and anophthalmia). A large study conducted to investigate this effect showed, at atmospheres of 50,000ppm, slight maternal and fetal toxicity, as well as a statistically significant increase in the incidence of fetal eye defects. However, the incidence was very low and within the range seen in other control groups. No effects were seen in the next lower dose used (1,000ppm). In a developmental toxicity study in rabbits, no fetal effects were seen at concentrations up to and including 60,000ppm, a dose level which elicited slight maternal toxicity.

Although chlorodifluoromethane has some mutagenic activity in the Ames test, this effect appears to be specific to bacteria, as a number of other in-vitro and in-vivo studies have not demonstrated any significant genotoxic activity.

No adverse effects were found in a study in which rats were maintained to week 104 after receiving 300mg/kg bodyweight/day chlorodifluoromethane by gavage for 52 weeks. In a 2-year inhalation study, rats were exposed to concentrations up to 50,000ppm for 118 weeks (females) and 131 weeks (males), at which times survival was 80%. There were no clinical haematological or biochemical changes in treated animals. In the male group exposed to 50,000ppm, there was a statistically significant increase in numbers of malignant tumors, mainly being fibrosarcoma. This increase occurred particularly late in the study (weeks 105 to 130). No effect was seen in females or at lower exposure concentrations in males. In an analogous study in the mouse, exposures of up to 50,000ppm for 83 weeks (males) and 94 weeks (females) did not give rise to increased incidence of benign or malignant tumors.

## 12. Ecological Information

**Persistence and degradation:** Decomposes comparatively rapidly in the lower atmosphere (troposphere). Estimated atmospheric lifetime is 15.8 years. Products of decomposition will be highly dispersed and hence have a very low concentration. Is not a significant contributor to photochemical smog and is not considered to be a VOC. Ozone depletion potential (ODP) is 0.055 measured against a standard of 1 for CFC11 (as defined by UNEP).

**Effect on effluent treatment:** Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

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## 13. Disposal Considerations

**Disposal method:** Discarded product is not a hazardous waste under RCRA, 40 CFR 261. However, HCFC22 should be recycled, reclaimed or destroyed whenever practicable.

**Stationary Refrigeration and Air-Conditioning:** Subject to "no-venting" regulations under Section 608 and 609 of the Clean Air Act during service or disposal of equipment.

**Container disposal:** For disposable (DOT 39) cylinders only: Do not distribute, make available, furnish or reuse empty container when once emptied of original product. Open valve to remove pressure in the cylinder. Then puncture, drill, crush or otherwise destroy empty cylinder and dispose of in a facility permitted for nonhazardous waste.

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## 14. Transport Information

**DOT Hazard Description:**

**Proper Shipping Name:** CHLORODIFLUOROMETHANE (R22), NONFLAMMABLE GAS

**Hazard Class:** 2.2

**Identification Number:** UN 1018

**Packing Group:** None

**Hazardous Substance (RQ):** None

**Placard/Label:** NON-FLAMMABLE GAS

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## 15. Regulatory Information

**TSCA (Toxic Substances Control Act) Regulations, 40 CFR 710:** All ingredients are on the TSCA Chemical Substances Inventory.

**CERCLA and SARA Regulations (40 CFR 355, 370 and 372):** Section 313 Supplier Notification: This product contains the following toxic chemicals subject to reporting requirements of SARA Section 313:

Chlorodifluoromethane (CAS 75-45-6)

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The information herein is given in good faith, but no warranty, expressed or implied, is made.

\*\*\* Indicate changes since prior revision.