

MATERIAL SAFETY DATA SHEET (MSDS)

Please retain for your records.

MATERIAL SAFETY DATA SHEET

ZSC05B
2W198, 2W199, 2W218

DU PONT CHEMICALS
"FREON" 22
Z008FR
Revised 13-Aug-92

#MATERIAL IDENTIFICATION

Corporate Number: DU000025
"FREON" is a registered trademark of Du Pont.
Manufacturer/Distributor:
Du Pont, 1007 Market St., Wilmington, DE 19898
Phone Numbers:
Product Information: 1-800-441-9442
Transport Emergency: CHEMTREC: 1-800-424-9300
Medical Emergency: 1-800-441-3637
Chemical Family: HALOGENATED HYDROCARBON
Trade Names and Synonyms: CC0335
Du Pont Registry Number: DP31-32-7
Formula: C₂HClF₂
Molecular Weight: 86.47
TSCA Inventory Status: Reported/Included
NPCA-HMIS Ratings:
Health: 1
Flammability: 0
Reactivity: 1
Personal Protection rating to be supplied by user depending on use conditions.

COMPONENTS

Material	CAS Number	Percent
METHANE, CHLORODIFLUORO- (HCFC 22)	75-45-6	100

PHYSICAL DATA

Boiling Point: -40.8 deg C (-41.4 deg F)
Vapor Pressure: 151 psig at 25 deg C (77 deg F)
Vapor Density: (Air=1.0) 3.03 at 25 deg C (77 deg F)
% Volatiles: 100 WT %
Evaporation Rate: >1 (CC14 = 1.0)
Water Solubility: 0.30 WT % at 25 deg C (77 deg F)
pH: Neutral
Odor: Slight ethereal
Form: Liquified gas
Color: Clear, colorless
Density: 1.194 g/cc at 25 deg C (77 deg F) - Liquid

HAZARDOUS REACTIVITY

Instability:
Material is stable. However, avoid open flames and high temperatures.
Incompatibility:
Incompatible with alkali or alkaline earth metals- powdered Al, Zn, Be, etc.
Polymerization: Polymerization will not occur.
Decomposition:
Decomposition products are hazardous. "FREON" 22 can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

#FIRE AND EXPLOSION DATA

Flash Point: None
Method: TOC
Autodecomposition: 632 deg C (1,170 deg F)
Other burning materials may cause HCFC 22 to burn weakly.

Chlorodifluoromethane is not flammable at ambient temperatures and atmospheric pressure. However, chlorodifluoromethane 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 "FREON" 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. Extinguishant for other burning material in area is sufficient to stop burning.

#Special 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.

#HEALTH HAZARD INFORMATION

Inhalation of 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. Liquid contact can cause frostbite.

ANIMAL DATA:

Inhalation 4-hour LC50: 220,000 ppm in rats
The compound is untested for skin and eye irritancy, and is untested for animal sensitization. Toxicity described in animals exposed by inhalation to concentrations ranging from 5% to 70% include effects on the central nervous system, liver, lungs, kidneys, spleen; cardiac sensitization; decreased body weight gain; and partial anesthesia. In chronic inhalation studies FC-22 produced a small, but statistically significant, increase of tumors in male rats, but not female rats or male or female mice at a concentration of 50,000 ppm (v/v). In the same studies, no carcinogenic effects were seen in either species at concentrations of 10,000 ppm or 1000 ppm (v/v). FC-22 was mutagenic in bacterial cell cultures but not mammalian cell cultures, and was not mutagenic in whole animal assays. A slight, but significant, increase in developmental toxicity (eye malformations, decreased fetal weights) has been observed in the offspring of rats exposed to high concentrations (50,000 ppm) of FC-22, a concentration which was also maternally toxic; no effects on the fetus or the maternal rats were seen at 1000 or 100 ppm. Developmental toxicity studies in rabbits at 50,000, 1000 and 100 ppm FC-22 were negative. Based on these findings, FC-22 is not considered a unique hazard to the conceptus and poses no carcinogenic hazard when exposures are below the TLV. Studies of the effects of FC-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 on developmental toxicity do not indicate adverse effects on female reproductive performance at concentrations up to 50,000 ppm (v/v).

HUMAN HEALTH EFFECTS:

Overexposure to the vapors by inhalation may include temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Higher exposures to the vapors may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality may occur from gross overexposure. Skin contact with the liquid may cause frostbite.

Individuals with preexisting diseases of the central nervous or cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity:

None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

Applicable Exposure Limits:

METHANE, CHLORODIFLUORO- (HCFC 22)
AEL (Du Pont): None Established
TLV (ACGIH): 1,000 ppm, 3,540 mg/m³ - 8 Hr TWA
PEL (OSHA): 1,000 ppm, 3,500 mg/m³ - 8 Hr TWA

*AEL is Du Pont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

Safety Precautions:

Use with sufficient ventilation to keep employee exposure below recommended limits. "FREON" 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.

#FIRST AID

INHALATION:

If large concentrations are 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 skin with water for 15 minutes. Treat for frostbite if necessary by gently warming affected areas. If irritation is present, call a physician.

EYE CONTACT:

In case of contact, immediately flush eyes with plenty of water for 15 minutes. Call a physician.

INGESTION:

Ingestion is not considered a potential route of exposure.

Notes to Physician:

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be considered as a last resort in life-threatening emergencies.

#PROTECTION INFORMATION

Generally Applicable Control Measures and Precautions:
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.

#DISPOSAL INFORMATION

Spill, Leak, or Release:

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal:

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

#SHIPPING INFORMATION

DOT

Proper Shipping Name: CHLORODIFLUOROMETHANE
Hazard Class: NONFLAMMABLE GAS, 2.2
UN/NA No.: UN 1018
DOT Label(s): NONFLAMMABLE GAS
DOT Placard: NONFLAMMABLE GAS

DOT/IMO

Proper Shipping Name: CHLORODIFLUOROMETHANE
Hazard Class: 2.2
UN No.: 1018
DOT/IMO Label: NONFLAMMABLE GAS
Shipping Containers: Tank Car
Cylinders

STORAGE CONDITIONS

Clean, dry area. Do not heat above 52 deg C (125 deg F).

TITLE III HAZARD CLASSIFICATIONS

Acute: Yes
Chronic: No
Fire: No
Reactivity: No
Pressure: Yes
Lists:
Extremely Hazardous Substance: No
CERCLA Hazardous Substance: No
Toxic Chemicals: No

=====

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS: W.J. Brock
Du Pont Chemicals
P.O. Box 80709, Chestnut Run
Wilmington, DE 19880-0709

Indicates updated section.