

MATERIAL SAFETY DATA SHEET

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5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Water fog or fine spray. Carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effective.

HAZARDOUS COMBUSTION PRODUCTS: Incomplete combustion may lead to the build-up of toxic pyrolysis products. Complete combustion will result in: Carbon oxides, Nitrogen oxides, Water, Ammonia, Hydrochloric acid, Hydrofluoric acid, Chlorine, Fluorine, Phosgene, Phosphorous oxides, and trace amounts of Hydrogen Cyanide

PROTECTION OF FIREFIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

SPECIFIC FIRE OR EXPLOSION HAZARDS: Will support combustion.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Isolate area. May be a slipping hazard. Wear adequate personal protective equipment, see Section 8, EXPOSURE CONTROLS/PERSONAL PROTECTION.

ENVIRONMENTAL PRECAUTIONS: Contain material to prevent contamination of ground and surface water. Spills should be collected to prevent contamination of waterways. Recover if possible, or dispose of according to applicable regulations, see Section 13, DISPOSAL CONSIDERATIONS.

METHODS OF CLEANING UP: Spills should be contained by, and covered with large quantities of sand, earth or any other readily available absorbent material which is then brushed in vigorously to assist absorption. The mixture can then be collected into drums and removed for disposal. Wash area from residues with soap and water and rinse down. Contaminated water should be retained, not being allowed to flow into ground or surface water.

7. HANDLING AND STORAGE

CAUTION! Contents under pressure.
Avoid open flames.
Do not puncture or incinerate.

Handling

Since polyols are handled together with diisocyanates, proper distinction between these two kinds of products is essential in order to avoid undesired mixing resulting in uncontrolled polymerisation.

Storage

Keep container tightly closed; product is hygroscopic.

- Storage Temperature and Shelf-Life
75°F (26°C)

8. EXPOSURE CONTROL/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

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PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: For most conditions, no respiratory protection is needed; however, if handling at elevated temperature without sufficient ventilation or in presence of aerosols, use an approved air-purifying respirator. Atmospheric levels should be maintained below the exposure guideline.

Skin Protection: Use gloves impervious to this material. Wear clean, long-sleeved, body covering clothing. After work and before eating, drinking or smoking wash and clean yourself carefully with soap and water. Contaminated clothing should be washed and/or dry cleaned before re-use.

Eye/Face Protection: Use chemical goggles. If vapor exposure causes eye discomfort, use a full-face respirator. Eye wash fountain should be located in immediate work area.

EXPOSURE GUIDELINES:

Chlorodifluoromethane (HCFC-22): ACGIH Threshold Limit Value (TLV) is 1000 ppm TWA-8 hours.

1,1,1,2-Tetrafluoroethane (134A): AIHA Workplace Environmental Exposure Level Guide (WEEL) is suggested at 1000 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Specific gravity	: 1.2
Water solubility	: Not Determined
Flash point	: >212 deg.F (100 deg.C)
Vapor Pres. (21°C/70°F)	: 2500mmHg

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under recommended storage conditions.

CONDITIONS TO AVOID: Product can oxidize and decompose at elevated temperatures. Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition. Storage at temperatures higher than recommended storage temperatures may lead to pressure build-up in closed containers. Do not store in open sunshine.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid contact with oxidizing materials. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat. Avoid contact with strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: None under normal conditions of storage and use.

HAZARDOUS POLYMERIZATION: Will not occur by itself.

11. TOXICOLOGICAL INFORMATION

Assessments based on studies of the individual components of the material.

INGESTION: The oral LD50 for rats is expected to be >2000 mg/kg.

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SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. The LD50 for skin absorption in rabbits is expected to be >2000 mg/kg.

INHALATION: At room temperature exposures to vapors may be due to presence of 1,1,1,2-Tetrafluoroethane and HCFC-22. Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

Acute inhalation toxicity of HCFC-22 is low, but exposure to high concentrations produces stimulation, then depression of the central nervous system, and finally asphyxiation.

Acute inhalation toxicity of 1,1,1,2-tetrafluoroethane is low, but exposure to high concentrations causes asphyxiation.

EYE CONTACT: May cause moderate eye irritation. Vapors may irritate eyes.

SYSTEMIC EFFECTS:

Chlorodifluoromethane (HCFC-22):

Signs and symptoms of excessive exposure may include:

Central nervous system effects.

Anaesthetic effects.

Narcotic effects.

Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats).

CARCINOGENICITY: A slightly increased tumor incidence has been observed in one study using male rats exposed to 50,000 ppm HCFC-22 (50 times the current ACGIH TLV). The test material used in that study contained impurities among which HCFC-31, a known mutagen and carcinogen. No increased tumor incidences have been observed in female rats or in mice of both sexes. The data do not indicate that HCFC-22 constitutes a carcinogenic hazard to man.

MUTAGENICITY: Chlorodifluoromethane (HCFC-22): Animal mutagenicity studies were negative. In vitro mutagenicity tests were negative in some cases and positive in other cases.

DEVELOPMENTAL/REPRODUCTIVE EFFECTS: Chlorodifluoromethane (HCFC-22): Has caused birth defects in laboratory animals only at doses toxic to the mother.

These results are considered to be of no significance for humans occupationally exposed by inhalation to levels below recommended exposure guidelines.

12. ECOLOGICAL INFORMATION

Assessment largely or completely based on data for similar material(s).

MOBILITY AND BIOACCUMULATION POTENTIAL: HCFC-22& HFC 134a: Volatilization from water to air is expected.

DEGRADATION: Material is expected to be very stable in the environment. Because of low biodegradability the product should be prevented from reaching water/soil compartment. The chlorofluoromethanes as a group have been implicated as transporters of chlorine to the stratosphere where the latter may catalyze ozone destruction. The stratospheric ozone depletion potential (ODP) of 1,1,1,2-Tetrafluoroethane, relative to CFC-11 and CFC-12 (ODP=1) is 0 .

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AQUATIC TOXICITY: Despite the very slow biodegradation rate the product should not present an environmental hazard in the water/soil compartment.

13. DISPOSAL CONSIDERATIONS

Do not puncture or incinerate.
Relieve all pressure prior to disposal.
Empty cylinders, once relieved of all pressure, can be disposed as non-hazardous waste.

The generation of waste should be avoided or minimized wherever possible. Dispose of leftover chemical waste under controlled conditions in accordance with all local and national laws and regulations.

This product does not meet the definition of Federal RCRA hazardous waste. To insure proper disposal, check with local and state authorities for instructions.

14. TRANSPORT INFORMATION

Compressed gases, N.O.S. (Chlorodifluoromethane, Tetrafluoroethane, Nitrogen),
2.2 UN 1956

15. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

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SARA 313 INFORMATION: This product contains the following subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER
Chlorodifluoromethane	75-45-6

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories for the following chemicals:

Chlorodifluoromethane
Immediate

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the

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15. REGULATORY INFORMATION

composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
----- Chlorodifluoromethane	----- 75-45-6	----- MA NJ3, PA1, PA3

MA=Massachusetts Right to Know Substance List
NJ3=New Jersey Workplace Hazardous Substance
PA1=Pennsylvania Hazardous Substance
PA3=Pennsylvania Environmental Hazardous Substance

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

CANADIAN REGULATIONS

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CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):
All substances in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. OTHER INFORMATION

No other information.