CHEMICAL PRODUCT/COMPANY IDENTIFICATION

MATERIAL IDENTIFICATION
"Formula CCIF2CCIF2

TRADE NAMES AND SYNONYMS
DICHLOROTETRAFLUOROETHANE
DICHLOROTETRAFLUOROETHANE, 1,2-ETHANE, 1,2-DICHLOROTETRAFLUORO
F-114
REFRIGERANT 114

COMPANY IDENTIFICATION
Manufacturer/Distributor
Hudson Technologies Company
One Blue Hill Plaza, PO Box 1541
Pearl River, NY 10965

Phone Numbers
Product information: 1-800-953-2244
Transport Emergency: CHEMTREC 1-800-424-9300
Medical Emergency: 1-800-501-4376

COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENTS
Material CAS Number %
*1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE 76-14-2 100

HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS
Skin contact with the liquid may include mild skin irritation mainly due to rapid evaporation, with possible discomfort or rash. Prolonged skin contact may cause temporary tingling, numbness, coldness, or drying of skin. There are no reports of human sensitization. Significant skin permeation, and systemic toxicity, after contact appears unlikely.

Eye contact with the liquid may include mild eye irritation with discomfort, tearing, or blurring of vision. Inhalation of high concentrations may include: temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Gross overexposure may cause temporary alteration of the heart’s electrical activity with irregular pulse, palpitations, or inadequate circulation. One report in the literature cites several volunteers exposed to high concentrations of FC-114 from an aerosol can, experienced a temporary alteration of respiration and lowered heart rate.

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.
FIRST AID MEASURES

INHALATION
Immediately remove to fresh air. Keep persons calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT
Flush with water. Treat for frostbite if necessary. Get medical attention if irritation is present.

EYE 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 be used with special caution in situations of emergency life support.

FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
Flash Point: Will not burn
Method: TOC
Flammable limits in Air, % by Volume
LEL: Not applicable
UEL: Not applicable
Autoignition: Not determined
Autodecomposition: >593 C (>1099 F)

FIRE AND EXPLOSION HAZARDS
Cylinders are equipped with pressure and temperature relief devices but still may rupture under fire conditions. Decomposition may occur.

EXTINGUISHING MEDIA
As appropriate for combustibles in area.

FIRE FIGHTING INSTRUCTIONS
Self-contained breathing apparatus (SCBA) is required if cylinders rupture or release contents under fire conditions. Use water spray or fog to cool containers.

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 places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) in case of large spills. Comply with Federal, State, and local regulations on reporting releases.

HANDLING AND STORAGE
Avoid breathing vapors and contact of liquid with skin or eyes. Use with sufficient ventilation to keep employee exposure below recommended limits.

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

**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 should be used if liquid contact with skin is possible. Chemical splash goggles should be available for use as needed to prevent liquid contact with the eyes. 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**

**APPLICABLE EXPOSURE LIMITS**

<table>
<thead>
<tr>
<th>Limit</th>
<th>Value</th>
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<tbody>
<tr>
<td>PEL (OSHA)</td>
<td>1,000 ppm, 5,600 mg/m³, 8 Hr. TWA</td>
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<tr>
<td>TLV (ACGIH)</td>
<td>1,000 ppm, 6,990 mg/m³, 8 Hr. TWA, A4</td>
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**PHYSICAL AND CHEMICAL PROPERTIES**

**PHYSICAL DATA**
- Boiling Point: 4 C (39 F)
- Vapor Pressure: 31 psia @ 25 C (77 F) (77 deg F)
- Vapor Density: 6.2 (Air=1.0) @ 25 C (77 F)
- % Volatiles: 100 WT%
- Evaporation Rate: >1 (CCl4=1.0)
- Solubility in Water: 0.013 WT% @ 25 C (77 F)

**PHYSICAL AND CHEMICAL PROPERTIES - CONTINUED**

**PHYSICAL DATA**
- Odor: Slight ethereal
- Form: Liquefied gas
- Color: Clear, colorless
- Density: 1.46 g/cm³ @ 25 C (77 F) - Liquid C (77 deg F) - Liquid

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

**INCOMPATIBILITY WITH OTHER MATERIALS**
Incompatible with alkali or alkaline earth metals- powdered Al, Zn, Be, etc.

**DECOMPOSITION**
Decomposition products are hazardous. 114 can decompose at high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

**POLYMERIZATION**
Polymerization will not occur.
OTHER HAZARDS
Decomposition: Decomposition products are hazardous. 114 can decompose at high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

TOXICOLOGICAL INFORMATION
ANIMAL DATA
Inhalation 0.5 hour LC50: 720,000 ppm in rats Oral ALD: >2250 mg/kg (in peanut oil) in rats No standard testing has been done for skin or eye irritancy, or for animal sensitization; however, a concentrated spray of FC-114 caused mild skin and eye irritation in animals. The effects in animals during single high exposures (25-500 times the TLV) include respiratory irritation and altered respiration, anaesthesia and central nervous system effects, and irregular heartbeat (cardiac arrhythmias) due to the heart being made more sensitive to adrenalin (cardiac sensitization). Anaesthetized animals given high doses showed slight cardiovascular effects and altered blood pressure. In one study, repeated high exposures at 200,000 ppm caused respiratory irritation and slight hematology effects in rats and mice. However, in the same study, no effects were seen at 100,000 ppm. Repeated exposure of guinea pigs to high concentrations resulted in slight liver effects. Long-term exposure to 10,000 ppm caused no evidence of toxicity in rats and rabbits.

Repeated spraying of FC-114 onto the skin caused irritation and slight inflammation. Repeated ingestion of FC-114 in corn or peanut oil caused no nutritional, hematological, biochemical or histopathological signs of toxicity.

One limited study in which mice were exposed for 23 months to a chlorofluorocarbon mixture containing 25% FC-114, showed no evidence of carcinogenic activity or other signs of toxicity. This compound does not produce genetic damage in bacterial cell cultures but has not been tested in animals. Tests for developmental or reproductive toxicity have not been performed.

ECOLOGICAL INFORMATION
ECOTOXICOLOGICAL INFORMATION
Ecotoxicological Information
Aquatic Toxicity:
96-hour LC50, killifish: 45 ppm

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

TRANSPORTATION INFORMATION
SHIPPING INFORMATION
OT/IMO/IATA Proper
Shipping Name 1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE
Hazard Class 2.2
Un No. 1958
Shipping Label Nonflammable Gas
Shipping Containers Tank Cars
Tank Trucks
Cylinders
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: No
LISTS:
Extremely Hazardous Substance: No
CERCLA Hazardous Substance: No
Toxic Chemicals: Yes

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.

ADDITIONAL INFORMATION
R-114 contains very low levels of carbon tetrachloride and chloroform, chemicals known to the State of California to cause cancer.

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:
MSDS Coordinator
Responsibility for MSDS: Stephen Mandracchia
Hudson Technologies Company
One Blue Hill Plaza, PO Box 1541
Pearl River, NY 10965
800-953-2244

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS