

_____ DuPont(TM) ISCEON(R) M099 Revised 9-Mar-11 Printed 03/09/2011 CEF0MO99 _____ Substance ID :130000031356 _____ CHEMICAL PRODUCT/COMPANY IDENTIFICATION _____ Material Identification Molecular Weight : 99.1 Tradenames and Synonyms ISCEON(R) Company Identification MANUFACTURER/DISTRIBUTOR E.I. du Pont Canada Company P.O. Box 2200 Streetsville Mississauga, Ontario L5M 2H3 PHONE NUMBERS Product Information : 1-800-387-2122 Medical Emergency : 1-800-441-3637 (24 hours) _____ COMPOSITION/INFORMATION ON INGREDIENTS _____ Components Material CAS Number % 75-10-5 8.5 % Difluoromethane 354-33-6 45 % Pentafluoroethane 1,1,1,2-Tetrafluoroethane 811-97-2 44.2 % n-Butane 106-97-8 1.7 % Isopentane 78-78-4 0.6 % _____ HAZARDS IDENTIFICATION _____ Potential Health Effects Gross overexposure by inhalation may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness; irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death; and suffocation, if air is displaced by vapors.

Skin contact with liquid or escaping vapor may cause

frostbite. Significant skin permeation, and systemic toxicity, after contact appears unlikely. There are no

reports of human sensitization.

"Frostbite-like" effects may occur if liquid or escaping vapors contact the eyes.

Increased susceptibility to the effects of overexposure to this product may be observed in persons with pre-existing disease of the central nervous system or cardiovascular system.

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

First Aid

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

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.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point	:	No Flash point	
Flammable Limits	in Air, % b	y Volume:	
LEL	:	None per ASTM E6	581-98
UEL	:	None per ASTM E6	581-98
Autoignition	:	Not determined	

Fire and Explosion Hazards:

Cylinders may rupture under fire conditions. Decomposition may occur.

Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and color of torch flames. This flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames.

This product is not flammable in air at temperatures up to 100 deg. C (212 deg. F) at atmospheric pressure. However, mixtures of this product with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. This product can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing this product and air, or this product in an oxygen enriched atmosphere becomes combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this product should not be allowed to exist with air above atmospheric pressure or at high temperatures, or in an oxygen-enriched environment. For example: This product should NOT be mixed with air under pressure for leak testing or other purposes.

Experimental data have also been reported which indicate combustibility of HFC-134a, a component in this blend, in the presence of chlorine.

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

Cool cylinders with water spray or fog. Self-contained breathing apparatus (SCBA) is required if cylinders rupture and contents are released under fire conditions. Water runoff should be contained and neutralized prior to release.

_____ 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. Initial Containment Prevent material from entering sewers, waterways, or low areas. Spill Clean Up Recover free liquid for reuse or reclamation. Accidental Release Measures Ventilate area using forced ventilation, especially in low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills or releases. _____ HANDLING AND STORAGE _____ Handling (Personnel) Avoid breathing vapor. Avoid liquid contact with eyes and skin. Use with sufficient ventilation to keep employee exposure below recommended limits. Contact with chlorine or other strong oxidizing agents should also be avoided. See Fire and Explosion Data section. Handling (Physical Aspects) Keep container tightly closed. Storage Store in a cool, dry place. Store below 52 C (125 F). EXPOSURE CONTROLS/PERSONAL PROTECTION _____ Engineering Controls Avoid breathing vapors. Avoid contact with skin or eyes. Use with sufficient ventilation to keep employee exposure below the recommended exposure limit. Local exhaust should

be used if large amounts are released. Mechanical ventilation should be used in low or enclosed places.

Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas.

Personal Protective Equipment

Impervious gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. 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

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Applicable Exposure Limits
  Difluoromethane
  AEL * (DuPont) : 1000 ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA
  PentafluoroethanePEL (OSHA): None EstablishedTLV (ACGIH): None EstablishedAEL * (DuPont): 1000 ppm, 8 & 12 Hr. TWAWEEL (AIHA): 1000 ppm, 4900 mg/m3, 8 Hr. TWA
   1,1,1,2-Tetrafluoroethane
  PEL(OSHA): None EstablishedTLV(ACGIH): None EstablishedAEL * (DuPont): 1000 ppm, 8 & 12 Hr. TWAWEEL(AIHA): 1000 ppm, 8 Hr. TWA
   n-Butane
  PEL(OSHA): None EstablishedAEL *(DuPont): None Established
   Isopentane
                      : None Established
: 600 ppm, 8 Hr. TWA
   PEL (OSHA)
   TLV (ACGIH)
   * AEL is DuPont's Acceptable Exposure Limit. Where governmentally
   imposed occupational exposure limits which are lower than the AEL
   are in effect, such limits shall take precedence.
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PHYSICAL AND CHEMICAL PROPERTIES
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Physical Data
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pH:

Odor:

Form:

Color:

Stable.

Decomposition

Polymerization

Animal Data

Du Pont Material Safety Data Sheet

 Boiling Point:
 -45.4 F (-43 C) @ atmospher

 Vapor Pressure:
 161.3 psia @ 77 F (25 C)

 Vapor Density:
 3.5 (Air = 1) @ 77 F (25 C)

 % Volatile:
 100%

 -45.4 F (-43 C) @ atmospheric pressure Solubility in Water: <0.5 wt% @ 77 F (25 C) Neutral Slight Ether-like Liquified Gas Colorless Specific Gravity: 1.14 @ 77 F (25 C) Density: Liquid = 71.13 lb/cu ft @ 77 F (25 C) _____ STABILITY AND REACTIVITY _____ Chemical Stability Incompatibility with Other Materials Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc. Decomposes with heat. Potential decomposition products are hydrofluoric acid and possibly carbonyl fluoride. These materials are toxic and irritating. Contact should be avoided. Polymerization will not occur. _____ TOXICOLOGICAL INFORMATION _____ Difluoromethane: Inhalation: 4 hour, ALC, rat: > 520,000 ppm Difluoromethane has not been tested for eye irritation. Difluoromethane has not been tested for skin irritation or sensitization. Single inhalation exposure caused lethargy, spasms, loss of mobility in the hind limbs. Other effects

disturbance of heart rhythm caused by a heightened

include weak cardiac sensitization, a potentially fatal

sensitivity to the action of epinephrine. 250,000 ppm.

Repeated exposure caused pathological changes of the lungs, liver, spleen, kidneys. In more recent studies repeated exposure caused: No significant toxicological effects. No-Observed-Effect-Level (NOEL): 49,100 ppm.

No animal data are available to define the effects of difluoromethane: carcinogenicity, reproductive Animal data show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. This material has not been tested for its ability to cause permanent genetic damage in reproductive cells of mammals (not tested for heritable genetic damage).

Pentafluoroethane:

Inhalation 4 hour, ALC, rat: > 709,000 ppm

This material has not been tested for eye irritation.

This material has not been tested for skin irritation or sensitization.

Single exposure to high doses by inhalation caused: Lethargy. Labored breathing. Weak cardiac sensitization, a potentially fatal disturbance of heart rhythm caused by a heightened sensitivity to the action of epinephrine. Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 100,000 ppm. Repeated exposure caused: No significant toxicological effects. No-Observed-Adverse-Effect-Level (NOAEL): 50,000 ppm

No animal data are available to define the following effects of this material: carcinogenicity, reproductive toxicity. In animal testing this material has not caused developmental toxicity. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. This material has not been tested for its ability to cause permanent genetic damage in reproductive cells of mammals (not tested for heritable genetic damage).

1,1,1,2-Tetrafluoroethane (HFC-134a):

Inhalation 4 hour ALC: 567,000 ppm in rats

A short duration spray of HFC-134a vapor produced very slight eye irritation. Animal testing indicates HFC-134a is a slight skin irritant, but not a skin sensitizer.

Single inhalation exposures caused lethargy, narcosis,

increased respiratory difficulties, incoordination, tremors, lack of response to sound and salivation; following the cessation of treatment most animals returned to normal. Death occurred at very high concentrations (> 500,000 ppm) in some animals. Single exposure to near lethal doses caused pulmonary edema. Repeated exposure caused increased weight of the adrenals, liver and spleen, and decreased uterine and prostate weight. Repeated dosing of higher concentrations caused temporary tremors and incoordination. In other repeated exposure studies with rats exposed to concentrations of 49,500 ppm, and mice exposed up to 300,000 ppm, no significant differences were seen between exposed and control animals; in a different study mice exposed to concentrations up to 350,000 ppm there were mortalities, tremors and incoordination in the 350,000 ppm group. Head shaking and salivation occurred in dogs exposed to 150,000 ppm for 7 days; other parameters such as hematology, clinical chemical, body weight, and food consumption were unaffected. Testicular hormonal levels were affected in male rats and pituitary hormone changes occurred in female rats in a 2-week inhalation study but there were no other treatment-related changes. In a long-term inhalation study in rats and mice no treatment-related effects were seen. No signs of neurological disturbances were seen in an inhalation study to access neurotoxicity in rats.

Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine, occurred in dogs at concentrations of 75,000 ppm and higher.

In a two-year inhalation study, HFC-134a, at a concentration of 50,000 ppm, produced an increase in late-occurring benign testicular tumors, testicular hyperplasia and testicular weight. The no-effect-level for this study was 10,000 ppm. Animal data show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal. Reproductive data on male mice and male or female rats show no change in reproductive performance. Tests have shown that HFC-134a does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. In animal testing testing, HFC-134a has not caused permanent genetic damage in reproductive cells of mammals (has not produced heritable genetic damage).

n-Butane:

Inhalation 4 hour LC50: 658 mg/L in rats

The compound is untested for skin or eye irritancy, and for animal sensitization.

Inhalation: A single exposure to large amounts of butane produced central nervous system depression, anesthesia, and

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depression of the heart with lowered blood pressure.
  Repeated exposure produced lowered respiratory rate and
  narcosis.
  No animal test reports are available to define carcinogenic,
  developmental, or reproductive hazards.
  This compound does not produce genetic damage in bacterial
  cell cultures but has not been tested in animals.
   _____
ECOLOGICAL INFORMATION
_____
Ecotoxicological Information
  Aquatic Toxicity:
  1,1,1,2-Tetrafluoroethane:
  48 hour LC50 - daphnia magna: 980 mg/L
  96 hour LC50 - rainbow trout: 450 mg/L
  n-Butane:
  96 hour LC50 - >1,000 mg/L
_____
DISPOSAL CONSIDERATIONS
_____
Waste Disposal
  Treatment, storage, transportation, and disposal must be in
  accordance with applicable Federal, State/Provincial, and Local
  regulations.
_____
TRANSPORTATION INFORMATION
_____
Shipping Information
  DOT/IMO
  Proper Shipping Name : Refrigerant Gas, N.O.S.
                    (1,1,1,2-tetrafluoroethane and
                   Pentafluoroethane)
  Hazard Class : 2.2
  UN No.
                   : 1078
  Reportable quantity : No
  Marine Pollutant : No
DOT/IMO Label : Nonflammable Gas
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Shipping Information -- Canada

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TDG Proper Shipping Name : Refrigerant Gas, N.O.S. (1,1,1,2-tetrafluoroethane and Pentafluoroethane) TDG Class : 2.2 UN # : 1078 _____ REGULATORY INFORMATION _____ U.S. Federal Regulations TSCA Inventory Status : Listed. TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312 Acute : Yes Chronic : Yes Fire : No : Yes Reactivity : No Pressure : Yes Canadian Regulations WHMIS Classification: CLASS A Compressed Gas CEPA Status : DSL: REPORTED/INCLUDED. One or more components of this product are subject to a Significant New Activity (SNAc) restriction. Under the Canadian Environmental Protection Act (CEPA). _____ OTHER INFORMATION _____ NFPA, NPCA-HMIS NPCA-HMIS Rating : 1 Health Flammability Health : 0 : 1 Personal Protection rating to be supplied by user depending on use conditions. _____ The data in this Material Safety Data Sheet relates only to the

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.

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Responsibility for MSDS

(Continued)

FLUOROPRODUCTS E.I. E.I. du Pont Canada Company Company Box 2200, Streetsville Mississauga, Ontario, L5M 2H3 (905) 821-3300.

End of MSDS