The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

ISCEON(R) 39TC
6210FR Revised 20-SEP-2005

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Molecular Weight : 126

Tradenames and Synonyms

R-423A

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont Fluoroproducts
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS
Product Information : 1-800-441-7515 (outside the U.S. 302-774-1000)
Transport Emergency : CHEMTREC 1-800-424-9300(outside U.S. 703-527-3887)
Medical Emergency : 1-800-441-3637 (outside the U.S. 302-774-1000)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
1,1,1,2-Tetrafluoroethane	811-97-2	52.5
1,1,1,2,3,3,3-Heptafluoropropane	431-89-0	47.5

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

(HAZARDS IDENTIFICATION - Continued)

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, % by Volume:
LEL : None per ASTM E681-98
UEL : None per ASTM E681-98
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.

(EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

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

Applicable Exposure Limits

1,1,1,2-Tetrafluoroethane

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: None Established
AEL *	(DuPont)	: 1000 ppm, 8 & 12 Hr. TWA
WEEL	(AIHA)	: 1000 ppm, 8 Hr. TWA

1,1,1,2,3,3,3-Heptafluoropropane

AEL *	(DuPont)	: 1000 ppm, 8 & 12 Hr. TWA

* 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.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point:	-11 F (-24 C) @ atmospheric pressure
Vapor Pressure:	88 psia @ 77 F (25 C)
Vapor Density:	4.5 (Air = 1) @ 77 F (25 C)
% Volatile:	100%
Solubility in Water:	<0.5 wt% @ 77 F (25 C)
pH:	Neutral
Odor:	Slight Ether-like
Form:	Liquified Gas
Color:	Colorless
Specific Gravity:	1.28 @ 77 F (25 C)
Density:	Liquid = 79.7 lb/cu ft @ 77 F (25 C)

STABILITY AND REACTIVITY

Chemical Stability

Stable.

Incompatibility with Other Materials

Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition

Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride.

These materials are toxic and irritating. Contact should be avoided.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

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

(TOXICOLOGICAL INFORMATION - Continued)

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).

1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea):

Inhalation 4 hour LC50: > 788,698 ppm in rats

Repeated exposure of rats by inhalation for 4 weeks at concentrations up to 50,000 ppm revealed no toxicologically significants effects. The NOEL for this study was 50,000 ppm. A 90-day inhalation study in rats did not find any exposure related effects at 105,000 ppm. The NOEL for this study was 105,000 ppm.

Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine, occurred in dogs at 105,000 ppm. The NOAEL for cardiac sensitization was 90,000 ppm. In a different study to evaluate cardiac sensitization in dogs, concentrations of 90,000, 105,000, and 14,000 ppm caused a dose-related increase in incidence and severity; at 90,000 ppm efffects were minimal or mild in nature.

Inhalation studies of HFC-227ea in rabbits and rats do not suggest developmental toxicity at concentrations up to 105,000 ppm. Tests have shown that HFC-227ea does not cause genetic damage in bacterial or mammalian cell cultures. Tests in animals for carcinogenicity or reproductive

(TOXICOLOGICAL INFORMATION - Continued)

toxicity have not been conducted.

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

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. (Tetrafluoroethane, Heptafluoropropane)
Hazard Class	: 2.2
UN No.	: 1078
Reportable quantity	: No
Marine Pollutant	: No
DOT/IMO Label	: Nonflammable Gas

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Listed.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute	: Yes
Chronic	: Yes
Fire	: No
Reactivity	: No
Pressure	: 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.

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
>	: DuPont Fluoroproducts
Address	: Wilmington, DE 19898
Telephone	: (800) 441-7515

# Indicates updated section.

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