MATERIAL SAFETY DATA SHEET

R-409A
November 2018 Revised

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

MATERIAL IDENTIFICATION

Formula CHCLF2/CHCLFCF3/CH3CCLF2

TRADENAMES AND SYNONYMS

HCFC BLEND OF HCFC-22, HCFC-124 & HCFC-142b

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	%
*CHLORODIFLUOROMETHANE (HCFC-22)	75-45-6	60
*1-CHLORO-1,1-DIFLUOROETHANE (HCFC-142b)	75-68-3	15
*ETHANE, 2-CHLORO-1,1,1,2-TETRAFLUORO (HCFC-124)	2837-89-0	25

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

INHALATION: Immediate effects of overexposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Gross overexposure may cause: 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. Other effects include: Suffocation, if air is displaced by vapors or fatality from gross over-exposure. Decomposition products are hazardous.

SKIN CONTACT: Short-term overexposure may cause frostbite, if liquid or escaping vapor contacts the skin. Repeated and/or prolonged exposure may cause: Defatting of the skin with itching, redness or rash.

EYE CONTACT: Contact with the vapor or aerosol may cause eye irritation with tearing, pain, blurred vision or "frostbite-like" effects.

ADDITIONAL HEALTH EFFECTS: Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the: central nervous system, cardiovascular system.

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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
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
THIS MATERIAL MAY MAKE THE HEART MORE SUSCEPTIBLE TO ARRHYTHMIAS. Catecholamines such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.

FIRE FIGHTING MEASURES

 # FLAMMABLE PROPERTIES

Flash Point	No flash point
Flammable Limits in Air, % by Volume:	
LEL	None per ASTM E681
UEL	None per ASTM E681
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.

R-409A is not flammable in air at temperatures up to 100 deg C (212 deg F) at atmospheric pressure. However, mixtures of R-409A with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. R-409A can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing R-409A and air, or R-409A 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, R-409A should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example: R-409A should NOT be mixed with air under pressure for leak testing or other purposes.

Experimental data have also been reported which indicate combustibility of HCFC-22, a component in this blend, in the presence of chlorine.

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EXTINGUISHING MEDIA
Water Spray, Water Fog, CO2, Dry Chemical, Water.

FIRE FIGHTING INSTRUCTIONS
Wear self-contained breathing apparatus (SCBA) and full protective equipment. Cool tank/container with water spray. Keep personnel removed and upwind of fire. Shut off source of fuel, if possible and without risk. Water runoff should be contained and neutralized prior to release.

Hydrogen fluoride or hydrogen chloride fumes emitted during a fire can react with water to form hydrofluoric acid or hydrochloric acid. Wear neoprene gloves when handling refuse from fire.

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 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)
Do not get in eyes, on skin or clothing. Do not breathe vapor or mist. Use with sufficient ventilation to keep employee exposure below recommended limits. Wash contaminated clothing prior to reuse.

HANDLING (PHYSICAL ASPECTS)
Keep away from heat, sparks and flames. Open container only in well-ventilated area.

STORAGE
Keep away from heat, sparks and flames. Store in a well ventilated area away from heat and sunlight. Close container after each use. Store below 120 F (49 C).

EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS
Use only with adequate ventilation especially for enclosed and low area where vapors can accumulate.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION
Wear coverall chemical splash goggles.

RESPIRATORS
Wear NIOSH approved respiratory protection, as appropriate.

PROTECTIVE CLOTHING
Where there is potential for skin contact have available, and wear as appropriate, impervious gloves, apron, pants, and jacket.

Lined butyl gloves should be used to avoid prolonged or repeated exposure.

EXPOSURE GUIDELINES

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APPLICABLE EXPOSURE LIMITS

CHLORODIFLUOROMETHANE (HCFC-22)

PEL (OSHA)	None Established
TLV (ACGIH)	1,000 ppm, 3,540 mg/m3, 8 Hr. TWA, A4

1-CHLORO-1,1-DIFLUOROETHANE

PEL (OSHA)	None Established
TLV (ACGIH)	None Established
WEEL (AIHA)	1000 ppm, 8 Hr. TWA

ETHANE, 2-CHLORO-1,1,1,2-TETRAFLUORO

PEL (OSHA)	None Established
TLV (ACGIH)	None Established
WEEL (AIHA)	1000 ppm, 8 Hr. TWA

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Boiling Point	-31 F (-35 C)
Vapor Density	3.36 (Air=1.0)
Solubility in Water	Negligible
Specific Gravity	1.215 @ 70 F (21 C)
Vapor Pressure	107 psia @ 70 F (21 C)
% Volatiles	100 %
Odor	Faint, Ethereal, Ether.
Form	Liquified Gas.
Color	Clear, Colorless.

STABILITY AND REACTIVITY

CHEMICAL STABILITY

Stable.
Conditions contributing to instability: Thermal decomposition due to exposure to heat (>800 deg F) or fire.

CONDITIONS TO AVOID

Avoid flames, sparks, extremely hot metal, heating elements, pilot lights, static electricity, combustion engines, ignition sources, etc.

INCOMPATIBILITY WITH OTHER MATERIALS

Avoid contact with strong alkali or alkaline earth metals, finely powdered metals such as aluminum, magnesium or zinc and strong oxidizers since they may react with or accelerate decomposition of this material.

DECOMPOSITION

Thermal decomposition products include hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide and chlorine and possibly carbonyl halides. These materials are toxic and irritating. Contact should be avoided.

TOXICOLOGICAL INFORMATION

ANIMAL DATA

CHLORODIFLUOROMETHANE HCFC-22:

INHALATION: 4 hour, LC50, rat: 220,000 ppm

Animal testing indicates this material is a slight eye and skin irritant, but not a skin sensitizer.
INGESTION: Long-term exposure caused: No significant toxicological effects.

Single exposure to high doses caused: Central nervous system depression. Inactivity or anaesthesia. Lung noise. Altered respiratory rate. Histopathological changes of the liver. Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine. Repeated exposure caused: No significant toxicological effects. Long-term exposure caused: Reduced weight gain. Increased adrenals, kidney, liver, pituitary weight.

ADDITIONAL TOXICOLOGICAL EFFECTS:
In chronic inhalation studies, HCFC-22, at a concentration of 50,000 ppm (v/v), produced a small, but statistically significant increase of late-occurring tumors involving salivary glands in male rats, but not female rats or male or female mice. In the same studies, no increased incidence of tumors was seen in either species at concentrations of 10,000 ppm or 1000 ppm (v/v). Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal. This material is not considered a unique developmental hazard to the conceptus. Reproductive data on male animals show: No change in reproductive performance. 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. This material produces genetic damage in bacterial cell cultures. In mammalian cell cultures and animals, this material has not produced genetic toxicity. In animal testing, this material has not caused permanent genetic damage in reproductive cells of mammals (has not produced heritable genetic damage).

1-CHLORO-1,1-DIFLUOROETHANE (HCFC-142b)
Inhalation 2 hour LC50: 447,642 ppm in rats

The compound is untested for skin irritancy, is not an eye irritant, and is untested for animal sensitization.

Inhalation: Toxic effects of single inhalation exposures include respiratory irritation, loss of reflexes, and unconsciousness. Cardiac sensitization was seen in dogs exposed to concentrations of 5% and higher. Exposure of dogs or monkeys to concentrations of 5 to 20% for five minutes caused decreased blood pressure (hypotension). Repeated exposure produced only irritation of the lungs. Tests in animals demonstrate no carcinogenic, developmental, or reproductive toxicity. The compound does not produce genetic damage in animals or in bacterial and mammalian cell cultures. It does not produce heritable genetic damage.

ETHANE, 2-CHLORO-1,1,1,2-TETRAFLUORO (HCFC-124)
INHALATION: 4 hour, ALC, rat: 230,000 - 300,000 ppm.

Single exposure caused: Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine. Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 25,000 ppm. Single exposure caused: the following temporary effects - Inactivity or anaesthesia. Low blood pressure. Repeated exposure caused: Decreased body weight. Altered clinical chemistry. These effects were reversible. Repeated exposure caused: the following temporary effects - Inactivity or anaesthesia. Lethargy. Incoordination. Altered respiratory rate. One study showed: Increased liver weight.

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:
In animal testing this material has not caused carcinogenicity, developmental toxicity. No animal data are available to define the following effects of this material: reproductive 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).

ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
AQUATIC TOXICITY:

CHLORODIFLUOROMETHANE (HCFC-22)

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48 hour EC50 - Daphnia magna: 433 mg/L

DISPOSAL CONSIDERATIONS

WASTE DISPOSAL
Recycle or reclaim if possible. Reclaimed material may be incinerated but toxic and corrosive combustion products (HF and HCL) must be handled appropriately. Consult Federal, State or local authorities for proper disposal procedures.

TRANSPORTATION INFORMATION

SHIPPING INFORMATION
DOT/IMO/IATA

Proper Shipping Name	LIQUEFIED GAS, N.O.S. (CHLORODIFLUOROMETHANE, CHLOROTETRAFLUOROETHANE)
Hazard Class	2.2
UN No.	UN 3163
DOT/IMO Label	NONFLAMMABLE GAS

REGULATORY INFORMATION

 # U.S. Federal Regulations
TSCA Inventory Status : Listed.

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating	
Health	1
Flammability	0
Reactivity	1

California Prop. 65: This product does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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
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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