Genetron® 500

Version 2 | Revision Date 02/19/2009 | Print Date 04/23/2010

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Genetron® 500
MSDS Number	:	000000011260
Product Use Description	:	Refrigerant
Company	:	Honeywell International, Inc. 101 Columbia Road Morristown, NJ 07962-1057
For more information call	:	800-522-8001 (Monday-Friday, 9:00am-5:00pm)
In case of emergency call	:	**Medical: 1-800-498-5701**
	:	**Transportation: 1-800-424-9300 or +1-703-527-3887**
	:	(24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Form	:	Liquefied gas
Color	:	colourless
Odor	:	slight sweet ether-like
Hazard Summary	:	Warning! Container under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. Gas reduces oxygen available for breathing. Causes asphyxiation in high concentrations. The victim will not realize that he/she is suffocating. Inhalation may cause central nervous system effects. May cause cardiac arrhythmia. May cause drowsiness and dizziness. Do not breathe vapour. Irritating to eyes and skin. Avoid contact with skin, eyes and clothing. At higher temperatures, (>250°C), decomposition products may include hydrochloric acid (HCl), hydrofluoric acid (HF) and carbonyl halides. The ACGIH Threshold Limit Values (2007) for Hydrogen Fluoride are TLV-TWA 0.5 ppm and Ceiling Exposure Limit 2 ppm.

Potential Health Effects

Skin	:	Avoid skin contact with leaking liquid (danger of frostbite). May cause frostbite. Irritating to skin.
Eyes	:	Causes serious eye irritation.

May cause frostbite.

Ingestion : Unlikely route of exposure.
Effects due to ingestion may include:
Gastrointestinal discomfort

Inhalation : Gas reduces oxygen available for breathing.
Causes asphyxiation in high concentrations. The victim will not realize that he/she is suffocating.
Inhalation may cause central nervous system effects.
May cause cardiac arrhythmia.
Vapours may cause drowsiness and dizziness.

Chronic Exposure : None known.

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Dichlorodifluoromethane	75-71-8	73.80
1,1-Difluoroethane	75-37-6	26.20

SECTION 4. FIRST AID MEASURES

Inhalation : Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Use oxygen as required, provided a qualified operator is present. Call a physician. Do not give drugs from adrenaline-ephedrine group.

Skin contact : After contact with skin, wash immediately with plenty of water. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. If symptoms persist, call a physician.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In case of frostbite water should be lukewarm, not hot. If symptoms persist, call a physician.

Ingestion : Unlikely route of exposure. As this product is a gas, refer to the inhalation section. Do not induce vomiting without medical advice. Call a physician immediately.

Notes to physician

Treatment	:	Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions. Treat frost-bitten areas as needed.

SECTION 5. FIRE-FIGHTING MEASURES

Flash point	:	not applicable
Lower explosion limit	:	None
Upper explosion limit	:	None
Suitable extinguishing media	:	The product is not flammable. ASHRAE 34 Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Specific hazards during fire fighting	:	Contents under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources. Container may rupture on heating. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. In case of fire hazardous decomposition products may be produced such as: Gaseous hydrogen chloride (HCl). Hydrogen fluoride Carbon monoxide Carbon dioxide (CO2) Carbonyl halides
Special protective equipment for fire-fighters	:	In the event of fire and/or explosion do not breathe fumes. Wear self-contained breathing apparatus and protective suit. No unprotected exposed skin areas.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear personal protective equipment. Unprotected persons must be kept away. Remove all sources of ignition. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. After release, disperses into the air. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid accumulation of vapours in low areas. Unprotected personnel should not return until air has been tested and determined safe. Ensure that the oxygen content is >= 19.5%.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. The product evaporates readily.
Methods for cleaning up	:	Ventilate the area.

SECTION 7. HANDLING AND STORAGE

Handling

Handling	:	Handle with care. Avoid inhalation of vapour or mist. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Follow all standard safety precautions for handling and use of compressed gas cylinders. Use authorized cylinders only. Protect cylinders from physical damage. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material. Do not remove screw cap until immediately ready for use. Always replace cap after use.
Advice on protection against fire and explosion	:	The product is not flammable. Can form a combustible mixture with air at pressures above atmospheric pressure.

Storage

Requirements for storage areas and containers	:	Pressurized container: Protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Keep containers tightly closed in a dry, cool and well-ventilated place. Storage rooms must be properly ventilated. Ensure adequate ventilation, especially in confined areas. Protect cylinders from physical damage.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures	:	Do not breathe vapour. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location.
Engineering measures	:	General room ventilation is adequate for storage and handling. Perform filling operations only at stations with exhaust ventilation facilities.
Eye protection	:	Wear as appropriate: Safety glasses with side-shields If splashes are likely to occur, wear: Goggles or face shield, giving complete protection to eyes
Hand protection	:	Leather gloves In case of contact through splashing: Protective gloves Neoprene gloves Polyvinyl alcohol or nitrile- butyl-rubber gloves
Skin and body protection	:	Avoid skin contact with leaking liquid (danger of frostbite). Wear cold insulating gloves/face shield/eye protection.
Respiratory protection	:	In case of insufficient ventilation wear suitable respiratory equipment. Wear a positive-pressure supplied-air respirator. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Keep working clothes separately.

Exposure Guidelines

Dichlorodifluoromethane	75-71-8	ACGIH	TWA		1,000 ppm
		NIOSH	REL	1,000 ppm	4,950 mg/m3
		US CA OEL	TWA PEL	1,000 ppm	4,950 mg/m3
		US CA OEL	Ceiling		6,200 ppm
		OSHA Z1	PEL	1,000 ppm	4,950 mg/m3
		OSHA Z1A	TWA	1,000 ppm	4,950 mg/m3
1,1-Difluoroethane	75-37-6	WEEL	TWA	1,000 ppm	2,700 mg/m3
		HONEYWELL	TWA		1,000 ppm
		Listed			

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	:	Liquefied gas
Color	:	colourless
Odor	:	slight sweet ether-like
pH	:	neutral
Freezing point	:	-158 °C (-252 °F)
Boiling point/boiling range	:	-33.5 °C (-28.3 °F)
Vapor pressure	:	6,901 hPa at 21.1 °C (70.0 °F)
Vapor pressure	:	15,975 hPa at 54.4 °C (129.9 °F)
Relative vapour density	:	4.2 (Air = 1.0)

Density	:	1.171 g/cm3 at 30 °C (86 °F)
Water solubility	:	not determined

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Decomposes under high temperature. Some risk may be expected of corrosive and toxic decomposition products. Can form a combustible mixture with air at pressures above atmospheric pressure. Do not mix with oxygen or air above atmospheric pressure.
Materials to avoid	:	Finely divided aluminium Potassium Calcium Powdered metals Aluminium Magnesium Zinc
Hazardous decomposition products	:	In case of fire hazardous decomposition products may be produced such as: Gaseous hydrogen chloride (HCl). Gaseous hydrogen fluoride (HF). Carbonyl halides Carbon monoxide Carbon dioxide (CO2)
Thermal decomposition	:	>250 °C
Hazardous reactions	:	Hazardous polymerisation does not occur. Stable under normal conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	LD50 rat Dose: > 1,500 mg/kg Test substance: 1,1-Difluoroethane (HFC-152a)
Acute inhalation toxicity	:	LC50 rat Dose: > 760000 ppm Exposure time: 4 h Test substance: Dichlorodifluoromethane (CFC-12)

Acute inhalation toxicity	:	LC50 rat Dose: ca. 383000 ppm Exposure time: 2 h Test substance: 1,1-Difluoroethane (HFC-152a)
Sensitisation	:	Cardiac sensitization dogs Test substance: Dichlorodifluoromethane (CFC-12) Threshold - 50,000 ppm
Sensitisation	:	Cardiac sensitization dogs Test substance: 1,1-Difluoroethane (HFC-152a) No-observed-effect level (NOEL) >150,000 ppm
Repeated dose toxicity	:	Subchronic toxicity NOEL: 10000 ppm Test substance: Dichlorodifluoromethane (CFC-12)
Repeated dose toxicity	:	Inhalation rat Chronic toxicity, No adverse response. Dose: 6 hr/d, 5 d/wk at levels up to 25,000 ppm Exposure time: 2 Years Test substance: 1,1-Difluoroethane (HFC-152a)
Repeated dose toxicity	:	Inhalation rat Carcinogenicity, Did not show carcinogenic effects in animal experiments. Dose: 6 hr/d, 5 d/wk at levels up to 25,000 ppm Exposure time: 2 Years Test substance: 1,1-Difluoroethane (HFC-152a)
Teratogenicity	:	rat Test substance: Dichlorodifluoromethane (CFC-12) Not a teratogen
Teratogenicity	:	rabbit Test substance: Dichlorodifluoromethane (CFC-12) Not a teratogen

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information	:	Accumulation in aquatic organisms is unlikely. This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82. Section 611 requires the following label text on all shipments of this product:

Warning: Contains Dichlorodifluoromethane (HCFC-12), a substance which harms public health and environment by destroying ozone in the upper atmosphere.
Refer to sections 610 and 612 for list of acceptable and unacceptable uses for this product.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Information: Observe all Federal, State, and Local Environmental regulations.
Additional advice : This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

SECTION 14. TRANSPORT INFORMATION

DOT	UN-Number	:	2602
	Proper shipping name	:	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE
	Class		2.2
	Packing group		
	Hazard Label		2.2
IATA	UN Number	:	2602
	Description of the goods	:	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE
	Class	:	2.2
	Hazard Label	:	2.2
	Packing instruction (cargo aircraft)	:	200
	Packing instruction (passenger aircraft)	:	200
IMDG	Substance No.	:	UN 2602
	Description of the goods	:	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE
	Class	:	2.2
	Hazard Label	:	2.2
	EmS Number	:	F-C
	Marine pollutant	:	no

SECTION 15. REGULATORY INFORMATION

Inventories

EU. EINECS : On the inventory, or in compliance with the inventory

US. Toxic Substances Control Act	:	On TSCA Inventory
Australia. Industrial Chemical (Notification and Assessment) Act	:	On the inventory, or in compliance with the inventory
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	:	All components of this product are on the Canadian DSL list.
Japan. Kashin-Hou Law List	:	On the inventory, or in compliance with the inventory
Korea. Toxic Chemical Control Law (TCCL) List	:	On the inventory, or in compliance with the inventory
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	:	On the inventory, or in compliance with the inventory
China. Inventory of Existing Chemical Substances	:	On the inventory, or in compliance with the inventory

National regulatory information

SARA 313 Components	:	Dichlorodifluoromethane	75-71-8
SARA 311/312 Hazards	:	Acute Health Hazard Sudden Release of Pressure Hazard	
CERCLA Reportable Quantity	:	6775 lbs	
California Prop. 65	:	This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.	
Massachusetts RTK	:	Dichlorodifluoromethane	75-71-8

	:	1,1-Difluoroethane	75-37-6
New Jersey RTK	:	Dichlorodifluoromethane	75-71-8
	:	1,1-Difluoroethane	75-37-6
Pennsylvania RTK	:	Dichlorodifluoromethane	75-71-8
	:	1,1-Difluoroethane	75-37-6
WHMIS Classification	:	A	

SECTION 16. OTHER INFORMATION

		HMIS III	**NFPA**
Health Hazard	:	1	2
Flammability	:	1	1
Physical Hazard	:	0	
Instability	:		0