

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

**SECTION 1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : Genetron MP66 (R-401B)  
MSDS Number : 000000011266  
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 : compressed liquefied gas

Color : colourless

Odor : slight 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. Irritating to eyes and skin. Avoid contact with skin, eyes and clothing. At higher temperatures, (>250 C), decomposition products may include 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.

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

- 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 percent
Chlorodifluoromethane	75-45-6	60.50 - 62.50
1-Chloro-1,2,2,2-tetrafluoroethane	2837-89-0	9.50 - 11.50
1,1-Difluoroethane	75-37-6	27.00 - 28.00
1-Chloro-1,1,2,2-tetrafluoroethane	354-25-6	<=1.40

**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.

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

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 (CO<sub>2</sub>)  
Carbonyl halides

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

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  $\geq 19.5\%$ .

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.

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

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.

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

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**

Chlorodifluoromethane	75-45-6	ACGIH	TWA	1,000 ppm	
		NIOSH	REL	1,000 ppm	3,500 mg/m3
		NIOSH	STEL	1,250 ppm	4,375 mg/m3
		US CA OEL	TWA PEL	1,000 ppm	3,500 mg/m3
		OSHA Z1A	TWA	1,000 ppm	3,500 mg/m3
1-Chloro-1,2,2,2-tetrafluoroethane	2837-89-0	WEEL	TWA	1,000 ppm	
		HONEYWELL	TWA	1,000 ppm	
		TX ESL	ST ESL	28000 ug/m3	
		TX ESL	AN ESL	2800 ug/m3	
1,1-Difluoroethane	75-37-6	WEEL	TWA	1,000 ppm	2,700 mg/m3
		TX ESL	ST ESL	13500 ug/m3	
		HONEYWELL	TWA	1,000 ppm	
		TX ESL	AN ESL	1350 ug/m3	

Listed

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Form : compressed liquefied gas

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

Color	: colourless
Odor	: slight ether-like
Molecular Weight	: 92.9 g/mol
pH	: neutral
Freezing point	: not determined
Boiling point/boiling range	: -34.7 °C (-30.5 °F)
Vapor pressure	: 6,536 - 7,419 hPa at 21.1 °C (70.0 °F)
Vapor pressure	: 15,878 - 17,278 hPa at 54.4 °C (129.9 °F)
Relative vapour density	: ca.3 (Air = 1.0)
Density	: 1.19 g/cm <sup>3</sup> at 25 °C (77 °F)
Water solubility	: 1 g/l at 25 °C (77 °F) at 1,013 hPa

**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:

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

Gaseous hydrogen chloride (HCl).

Gaseous hydrogen fluoride (HF).

Carbonyl halides

Carbon monoxide

Carbon dioxide (CO<sub>2</sub>)

Thermal decomposition : &gt;250 °C

Hazardous reactions : Hazardous polymerisation does not occur.  
Stable under normal conditions.**SECTION 11. TOXICOLOGICAL INFORMATION**Acute inhalation toxicity : LC50 rat  
Dose: > 300000 ppm  
Exposure time: 4 h  
Test substance: Chlorodifluoromethane (HCFC-22)Acute inhalation toxicity : LC50 rat  
Dose: 360000 ppm  
Exposure time: 4 h  
Test substance: 2-chloro-1,1,1,2- tetrafluoroethane. (HCFC-124)Additional advice : Acute Health Hazard  
Chlorodifluoromethane (HCFC-22): Cardiac sensitisation threshold (dog): 50000 ppm.  
2-chloro-1,1,1,2- tetrafluoroethane. (HCFC-124): Cardiac sensitisation threshold (dog): 25000 ppm.  
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.  
Irritating to eyes and skin.  
Rapid evaporation of the liquid may cause frostbite.  
Avoid skin contact with leaking liquid (danger of frostbite).  
May cause cardiac arrhythmia.  
Chronic Health Hazard  
In vitro tests did not show mutagenic effects  
In vivo tests did not show mutagenic effects**SECTION 12. ECOLOGICAL INFORMATION**

Additional ecological information : 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.

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

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 Chlorotetrafluoroethane (HCFC-124),  
Warning: Contains Chlorodifluoromethane (HCFC-22),  
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 : 3163  
Proper shipping name : LIQUEFIED GAS, N.O.S.  
(Chlorodifluoromethane, 1,1-Difluoroethane, 1-Chloro-1,2,2,2-tetrafluoroethane)  
Class : 2.2  
Packing group  
Hazard Labels : 2.2

**IATA** UN Number : 3163  
Description of the goods : LIQUEFIED GAS, N.O.S.  
(Chlorodifluoromethane, 1,1-Difluoroethane, 1-Chloro-1,2,2,2-tetrafluoroethane)  
Class : 2.2  
Hazard Labels : 2.2  
Packing instruction (cargo aircraft) : 200  
Packing instruction (passenger aircraft) : 200

**IMDG** Substance No. : UN 3163  
Description of the goods : LIQUEFIED GAS, N.O.S.  
(CHLORODIFLUOROMETHANE, 1,1-Difluoroethane, 1-CHLORO-1,2,2,2-TETRAFLUOROETHANE)  
Class : 2.2

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

Hazard Labels	:	2.2
EmS Number	:	F-C
Marine pollutant	:	no

**SECTION 15. REGULATORY INFORMATION****Inventories**

1907/2006 (EU)	:	This mixture contains only ingredients which have been subject to a pre-registration according to Regulation (EC) No. 1907/2006 (REACH).
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.
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
NZIOC - New Zealand	:	On the inventory, or in compliance with the inventory
TSCA 12B	:	US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
		1-Chloro-1,1,2,2-tetrafluoroethane 354-25-6

**National regulatory information**

<b>SARA 313 Components</b>	:	Chlorodifluoromethane	75-45-6
	:	1-Chloro-1,2,2,2-tetrafluoroethane	2837-89-0
	:	1-Chloro-1,1,2,2-tetrafluoroethane	354-25-6

**Genetron MP66 (R-401B)**

Version 2

Revision Date 08/25/2009

Print Date 07/11/2011

<b>SARA 311/312 Hazards</b>	:	Acute Health Hazard Sudden Release of Pressure Hazard
<b>California Prop. 65</b>	:	This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.
<b>Massachusetts RTK</b>	:	1,1-Difluoroethane 75-37-6 Chlorodifluoromethane 75-45-6
<b>New Jersey RTK</b>	:	Chlorodifluoromethane 75-45-6 1-Chloro-1,2,2,2-tetrafluoroethane 2837-89-0 1,1-Difluoroethane 75-37-6 1-Chloro-1,1,2,2-tetrafluoroethane 354-25-6
<b>Pennsylvania RTK</b>	:	Chlorodifluoromethane 75-45-6 1-Chloro-1,2,2,2-tetrafluoroethane 2837-89-0 1,1-Difluoroethane 75-37-6
<b>WHMIS Classification</b>	:	A This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.
<b>Global warming potential</b>	:	1,288
<b>Ozone depletion potential (ODP)</b>	:	0.04

**SECTION 16. OTHER INFORMATION**

	<b>HMIS III</b>	<b>NFPA</b>
Health hazard	: 1	2
Flammability	: 1	1
Physical Hazard	: 0	
Instability	:	0