

**Genetron® 113****000000009899**

Version 2.3

Revision Date 07/29/2014

Print Date 06/22/2015

**SECTION 1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : Genetron® 113

MSDS Number : 000000009899

Product Use Description : Refrigerant

Manufacturer or supplier's details : Honeywell International Inc.  
101 Columbia Road  
Morristown, NJ 07962-1057

For more information call : 800-522-8001  
+1-973-455-6300  
(Monday-Friday, 9:00am-5:00pm)

**In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414**  
: **Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887**  
:  
: (24 hours/day, 7 days/week)

**SECTION 2. HAZARDS IDENTIFICATION****Emergency Overview**

Form : liquid

Color : colourless

Odor : slight

**Classification of the substance or mixture**

Not a hazardous substance or mixture.

Precautionary statements : **Prevention:**  
Use personal protective equipment as required.

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Hazards not otherwise classified : Excessive exposure may cause central nervous system effects including drowsiness and dizziness. Excessive exposure may also cause cardiac arrhythmia.  
May cause eye and skin irritation.

**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**

Formula : C2Cl3F3

Chemical Name	CAS-No.	Concentration
1,1,2-Trichlorotrifluoroethane	76-13-1	100.00 %

**SECTION 4. FIRST AID MEASURES**

Inhalation : Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. 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. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use. If symptoms persist, call a physician.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Ingestion : Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician immediately.

**Notes to physician**

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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. Overdoses may cause paresthesias, generalized weakness, listlessness, vertigo, confusion, hypotension, cardiac arrhythmias and heartblock.

**SECTION 5. FIREFIGHTING MEASURES**

- Suitable extinguishing media : The product is not flammable.  
ASTM D-1310-67  
ASTM D 56-82  
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.  
Cool closed containers exposed to fire with water spray.
- Specific hazards during firefighting : 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.  
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:  
Carbon monoxide  
Carbon dioxide (CO<sub>2</sub>)  
Carbonyl halides  
Hydrogen fluoride  
Hydrogen chloride gas
- Special protective equipment for firefighters : Wear full protective clothing and self-contained breathing apparatus.
- Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions : Wear personal protective equipment.  
Immediately evacuate personnel to safe areas.  
Keep people away from and upwind of spill/leak.  
Remove all sources of ignition.  
Ventilate the area.  
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 : Should not be released into the environment.  
Do not flush into surface water or sanitary sewer system.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).
- Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

**SECTION 7. HANDLING AND STORAGE****Handling**

- Handling : Wear personal protective equipment.  
Do not breathe vapours or spray mist.  
Avoid contact with skin, eyes and clothing.  
Do not use in areas without adequate ventilation.  
Perform filling operations only at stations with exhaust ventilation facilities.  
Keep away from heat.  
Open drum carefully as content may be under pressure.
- Advice on protection against fire and explosion : Keep product and empty container away from heat and sources of ignition.

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**Storage**

Requirements for storage areas and containers : Keep containers tightly closed in a dry, cool and well-ventilated place.  
Store away from incompatible substances.  
Keep away from direct sunlight.  
Ensure adequate ventilation, especially in confined areas.  
Keep in original packaging, tightly closed.  
Protect from physical damage.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.  
Do not breathe vapours or spray mist.  
Avoid contact with skin, eyes and clothing.

Engineering measures : Use with local exhaust ventilation.  
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 : Impervious butyl rubber gloves  
Neoprene gloves  
Gloves must be inspected prior to use.  
Replace when worn.

Skin and body protection : Wear as appropriate:  
Solvent-resistant gloves  
Solvent-resistant apron and boots  
If splashes are likely to occur, wear:  
Protective suit

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-

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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.  
 Wash hands before breaks and immediately after handling the product.

**Exposure Guidelines**

Components	CAS-No.	Value	Control parameters	Update	Basis
1,1,2-Trichlorotrifluoroethane	76-13-1	STEL : Short term exposure limit	(1,250 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values
1,1,2-Trichlorotrifluoroethane	76-13-1	TWA : time weighted average	(1,000 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values
1,1,2-Trichlorotrifluoroethane	76-13-1	STEL : Short term exposure limit	9,500 mg/m <sup>3</sup> (1,250 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
1,1,2-Trichlorotrifluoroethane	76-13-1	REL : Recommended exposure limit (REL):	7,600 mg/m <sup>3</sup> (1,000 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
1,1,2-Trichlorotrifluoroethane	76-13-1	PEL : Permissible exposure limit	7,600 mg/m <sup>3</sup> (1,000 ppm)	02 2006	OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

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1,1,2- Trichlorotrifluoroethane	76-13-1	TWA : time weighted average	7,600 mg/m <sup>3</sup> (1,000 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)
1,1,2- Trichlorotrifluoroethane	76-13-1	STEL : Short term exposure limit	9,500 mg/m <sup>3</sup> (1,250 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Physical state	: liquid
Color	: colourless
Odor	: slight
pH	: Note: neutral
Melting point/freezing point	: -35 °C
Boiling point/boiling range	: 47.6 °C
Flash point	: Note: None
Evaporation rate	: > 1 Method: Compared to Butyl acetate.
Lower explosion limit	: Note: None
Upper explosion limit	: Note: None
Vapor pressure	: 0.4 kPa at 20 °C(68 °F)

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Vapor density	:	6.47
Density	:	1.56 g/cm <sup>3</sup>
Water solubility	:	0.17 g/l
Solubility in other solvents	:	Medium: Diethylether Note: soluble  Medium: Methanol Note: partly soluble
Partition coefficient: n-octanol/water	:	log Pow: 1.66 - 3.3 Note: The product is more soluble in octanol.
Ignition temperature	:	770 °C
Auto-ignition temperature	:	770 °C
Molecular weight	:	187.37 g/mol

**SECTION 10. STABILITY AND REACTIVITY**

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Hazardous polymerisation does not occur.
Conditions to avoid	:	Protect from heat/overheating. Keep away from direct sunlight. Heat, flames and sparks.
Incompatible materials to avoid	:	Calcium Potassium Powdered metals



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Finely divided aluminium  
Finely divided magnesium  
Zinc

Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as:  
Carbon monoxide  
Carbon dioxide (CO<sub>2</sub>)  
Carbonyl halides  
Hydrogen fluoride  
Hydrogen chloride gas

**SECTION 11. TOXICOLOGICAL INFORMATION**

Acute oral toxicity : LD50: 43,000 mg/kg  
Species: rat

Acute inhalation toxicity : LC50: 52500 ppm  
Exposure time: 4 h  
Species: rat

Acute dermal toxicity : LD50: > 11,000 mg/kg  
Species: rabbit

Sensitisation : Cardiac sensitization  
Species: dogs  
Note: Exposure levels of 5,000 ppm and greater resulted in increased sensitivity of the heart to adrenalin.

Repeated dose toxicity : Species: rat  
NOAEL (No observed adverse effect level): 12500 ppm

Genotoxicity in vitro : Result: negative

Genotoxicity in vivo : Result: negative

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Further information : Note: Did not show carcinogenic effects in animal experiments. Animal testing did not show any effects on foetal development. In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects May cause cardiac arrhythmia.

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity effects**

Toxicity to fish : LC50: 1,250 mg/l  
Exposure time: 96 h  
Species: Fathead minnow

**Elimination information (persistence and degradability)**

Biodegradability : Note: Minimal

**Further information on ecology**

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 Trichlorotrifluoroethane (CFC-113), 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**

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

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Note : 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** Not dangerous goods**TDG** Not dangerous goods**IATA** Not dangerous goods**IMDG** Not dangerous goods**SECTION 15. REGULATORY INFORMATION****Inventories**

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) : All components of this product are on the Canadian DSL.

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

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China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

**National regulatory information**

**SARA 302 Components** : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components** : The following components are subject to reporting levels established by SARA Title III, Section 313:  
: 1,1,2-Trichlorotrifluoroethane 76-13-1

**SARA 311/312 Hazards** : Acute Health Hazard

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

**Massachusetts RTK** : 1,1,2-Trichlorotrifluoroethane 76-13-1

**New Jersey RTK** : 1,1,2-Trichlorotrifluoroethane 76-13-1

**Pennsylvania RTK** : 1,1,2-Trichlorotrifluoroethane 76-13-1

**WHMIS Classification** : Not Rated  
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.

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**SECTION 16. OTHER INFORMATION**

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

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

**Further information**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group