

**Genetron Performax® LT (R-407F)**

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

**SECTION 1: Identification of the substance/mixture and of the company/undertaking**

**1.1. Product identifier**

Product name : Genetron Performax® LT (R-407F)  
SDS-number : 000000013866  
Type of product : Mixture  
Remarks : SDS according to Art. 31 of Regulation (EC) 1907/2006.

**1.2. Relevant identified uses of the substance or mixture and uses advised against**

Use of the Substance/Mixture : Refrigerant  
Uses advised against : none

**1.3. Details of the supplier of the safety data sheet**

Company : Honeywell Fluorine Products Europe B.V.  
Stationsplein Zuid-West 961  
1117 CE Schiphol-Oost  
Netherlands  
Telephone : +32 16 391 211  
Telefax :  
For further information,  
please contact: : PMTEU Product Stewardship:  
SafetyDataSheet@Honeywell.com  
Honeywell International, Inc.  
115 Tabor Road  
Morris Plains, NJ 07950-2546  
USA

**1.4. Emergency telephone number**

Emergency telephone number : +1-703-527-3887 (ChemTrec-Transport)  
+1-303-389-1414 (Medical)  
Country based Poison Control Center : see chapter 15.1

**SECTION 2: Hazards identification**

**2.1. Classification of the substance or mixture**

**REGULATION (EC) No 1272/2008**

Gases under pressure Liquefied gas  
H280 Contains gas under pressure; may explode if heated.

**2.2. Label elements**

**REGULATION (EC) No 1272/2008**


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Hazard pictograms	:		
Signal word	:	Warning	
Hazard statements	:	H280	Contains gas under pressure; may explode if heated.
Precautionary statements	:	P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ eye protection/ face protection.
		P284	In case of inadequate ventilation wear respiratory protection.
		P308 + P313	IF exposed or concerned: Get medical advice/ attention.
		P410 + P403	Protect from sunlight. Store in a well-ventilated place.

**2.3. Other hazards**

Contains gas under pressure; may explode if heated.

**SECTION 3: Composition/information on ingredients**

**3.1. Substance**

Not applicable

**3.2. Mixture**

Chemical name	CAS-No. Index-No. REACH Registration Number EC-No.	Classification 1272/2008	Concentration	Remarks
Norflurane	811-97-2 01-2119459374-33 212-377-0	Press. Gas ; H280	>= 25 % - < 50 %	1*
Pentafluoroethane	354-33-6 01-2119485636-25 206-557-8	Press. Gas ; H280	>= 25 % - < 50 %	1*
Difluoromethane	75-10-5 01-2119471312-47 200-839-4	Flam. Gas 1; H220 Press. Gas ; H280	>= 25 % - <= 50 %	1*

1\* - For specific concentration limits see Annexes of 1272/2008

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Remaining components of this product are non-hazardous and/or are present at concentrations below reportable limits.

Occupational Exposure Limit(s), if available, are listed in Section 8.  
For the full text of the H-Statements mentioned in this Section, see Section 16.

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**SECTION 4: First aid measures**

**4.1 Description of first aid measures**

*General advice:*

First aider needs to protect himself. Move out of dangerous area. Take off all contaminated clothing immediately.

*Inhalation:*

Remove to fresh air. Artificial respiration and/or oxygen may be necessary. Call a physician immediately.

*Skin contact:*

Rapid evaporation of the liquid may cause frostbite. In case of contact with liquid, thaw frosted parts with water, then remove clothing carefully. Wash with plenty of water. Consult a physician. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use.

*Eye contact:*

Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

*Ingestion:*

Ingestion is unlikely because of the physical properties and is not expected to be hazardous.

**4.2. Most important symptoms and effects, both acute and delayed**

no data available

**4.3. Indication of any immediate medical attention and special treatment needed**

Do not give adrenaline or similar drugs.

See Section 11 for more detailed information on health effects and symptoms.

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**SECTION 5: Firefighting measures****5.1. Extinguishing media***Suitable extinguishing media:*

The product is not flammable.

ASHRAE 34

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**5.2. Special hazards arising from the substance or mixture**

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.

Contents under pressure.

Container may rupture on heating.

Cool closed containers exposed to fire with water spray.

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Fire may cause evolution of:

Hydrogen fluoride

Carbon oxides

Halogenated compounds

Carbonyl halides

**5.3. Advice for firefighters**

Wear full protective clothing and self-contained breathing apparatus.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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**SECTION 6: Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

Immediately contact emergency personnel. Wear personal protective equipment. Unprotected persons must be kept away. Ensure adequate ventilation. In case of insufficient ventilation wear suitable respiratory equipment.

**6.2. Environmental precautions**

Prevent further leakage or spillage if safe to do so. The product evaporates readily.

**6.3. Methods and materials for containment and cleaning up**

Ventilate the area.

**6.4. Reference to other sections**

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For personal protection see section 8.

**SECTION 7: Handling and storage**

**7.1. Precautions for safe handling**

*Advice on safe handling:*

Open drum carefully as content may be under pressure. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material. Do not use in areas without adequate ventilation. Contaminated equipment (brushes, rags) must be cleaned immediately with water.

*Hygiene measures:*

Provide adequate ventilation. When using do not eat or drink.

**7.2. Conditions for safe storage, including any incompatibilities**

*Further information on storage conditions:*

Store in original container. Keep away from direct sunlight. Keep containers tightly closed in a cool, well-ventilated place.

**7.3. Specific end use(s)**

no additional data available

**SECTION 8: Exposure controls/personal protection**

**8.1. Control parameters**

**Occupational exposure limits:**

Components	Basis / Value type	Value / Form of exposure	Exceeding Factor	Remarks
Norflurane	HONEYWELL TWA	1.000 ppm		
Norflurane	EH40 WEL TWA	4.240 mg/m3 1.000 ppm		
Pentafluoroethane	HONEYWELL TWA	1.000 ppm		We are not aware of any national exposure limit.

TWA - Time weighted average

**DNEL/ PNEC-Values**

Component	End-use /	Exposure duration	Value	Exposure routes	Remarks

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	Impact				
Norflurane	Workers / Long-term systemic effects		13936 mg/m3	Inhalation	
Norflurane	Consumers / Long-term systemic effects		2476 mg/m3	Inhalation	
Difluoromethane	Workers / Long-term systemic effects		7035 mg/m3	Inhalation	
Difluoromethane	Consumers / Long-term systemic effects		750 mg/m3	Inhalation	
Pentafluoroethane	Workers / Long-term systemic effects		16444 mg/m3	Inhalation	
Pentafluoroethane	Consumers / Long-term systemic effects		1753 mg/m3	Inhalation	

Component	Environmental compartment / Value	Remarks
Norflurane	Fresh water: 0,1 mg/l	Assessment factor: 1000
Norflurane	Marine water: 0,01 mg/l	Assessment factor: 10000
Norflurane	Fresh water sediment: 0,75 mg/kg	Assessment factor: 100
Norflurane	Sewage treatment plant: 73 mg/l	Assessment factor: 10
Difluoromethane	Fresh water: 0,142 mg/l	Assessment factor: 1000
Difluoromethane	Fresh water sediment: 0,534 mg/kg dw	
Pentafluoroethane	Fresh water: 0,1 mg/l	Assessment factor: 1000
Pentafluoroethane	Fresh water sediment: 0,6 mg/kg dw	

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### 8.2. Exposure controls

#### Occupational exposure controls

The Personal Protective Equipment must be in accordance with EN standards:respirator EN 136, 140, 149; safety glasses EN 166; protective suit: EN 340, 463, 468, 943-1, 943-2; gloves EN 374, safety shoes EN-ISO 20345.

#### Personal protective equipment

##### *Respiratory protection:*

In case of insufficient ventilation wear suitable respiratory equipment.  
Self-contained breathing apparatus (EN 133)

##### *Hand protection:*

Protective gloves against cold  
(EN 511)

##### *Eye protection:*

Safety glasses with side-shields conforming to EN166  
Face-shield

##### *Skin and body protection:*

Protective footwear

#### Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

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## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Form	:	Liquefied gas
Colour	:	clear and colourless
Odour	:	ether-like
	:	no data available
Boiling point/boiling range	:	-45,5 °C at 1.013 hPa
Ignition temperature	:	no data available
Lower explosion limit	:	None

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Upper explosion limit	:	None
Vapour pressure	:	10.218 hPa at 21,1 °C
Density	:	no data available
pH	:	neutral
Water solubility	:	no data available
Partition coefficient: n- octanol/water	:	log Pow 1,06 1,1,1,2-tetrafluoroethane (HFC-134a)
Partition coefficient: n- octanol/water	:	log Pow 1,48 Ethane, pentafluoro- (HFC-125)
Relative vapour density	:	not determined

**9.2 Other Information**

no additional data available

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**SECTION 10: Stability and reactivity**

**10.1. Reactivity**

Stable under normal conditions.  
Hazardous polymerisation does not occur.

**10.2. Chemical stability**

no data available

**10.3. Possibility of hazardous reactions**

no data available

**10.4. Conditions to avoid**

Heating will cause pressure rise with risk of bursting  
Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.  
Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material.

**10.5. Incompatible materials**

oxidizing substances  
Possible incompatibility with alkali sensitive materials.



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Powdered metals

### 10.6. Hazardous decomposition products

Halogenated compounds

Hydrogen fluoride

Carbonyl halides

Carbon oxides

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

*Acute oral toxicity:*

no data available

*Acute dermal toxicity:*

no data available

*Acute inhalation toxicity:*

LC50

Species: Rat

Value: > 500000 ppm

Exposure time: 4 h

Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)

LC50

Species: Rat

Value: 520000 ppm

Exposure time: 4 h

Test substance: Difluoromethane (HFC-32)

LC50

Species: Rat

Value: > 769000 ppm

Exposure time: 4 h

Test substance: Ethane, pentafluoro- (HFC-125)

*Skin irritation:*

no data available

*Eye irritation:*

no data available

*Respiratory or skin sensitisation:*

Cardiac sensitization

Species: dogs

Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)

No-observed-effect level

50 000 ppm

Lowest observed effect level

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75 000 ppm

Cardiac sensitization

Species: dogs

Test substance: Difluoromethane (HFC-32)

No-observed-effect level

>350 000 ppm

Cardiac sensitization

Species: dogs

Test substance: Ethane, pentafluoro- (HFC-125)

No-observed-effect level

75 000 ppm

Lowest observed effect level

100 000 ppm

*Repeated dose toxicity:*

Species: Rat

Application Route: Inhalation

NOAEL: 50000 ppm

Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)

Note: Subchronic toxicity

Species: Rat

NOAEL: 10000 ppm

Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)

Note: Chronic toxicity

Species: Rat

Application Route: Inhalation

NOAEL: 50000 ppm

Test substance: Difluoromethane (HFC-32)

Note: Subchronic toxicity

Species: Rat

Application Route: Inhalation

NOAEL<sub>>=</sub>: 50000 ppm

Test substance: Ethane, pentafluoro- (HFC-125)

Note: Subchronic toxicity

*Germ cell mutagenicity:*

Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)

Note: In vitro tests did not show mutagenic effects

Test substance: Difluoromethane (HFC-32)

Note: In vitro tests did not show mutagenic effects

Test substance: Ethane, pentafluoro- (HFC-125)

Note: In vitro tests did not show mutagenic effects

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*Aspiration hazard:*  
no data available

*Other information:*  
Inhalation: May cause cardiac arrhythmia.

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**SECTION 12: Ecological information**

**12.1. Toxicity**

*Toxicity to fish:*  
no data available

*Toxicity to aquatic plants:*  
no data available

*Toxicity to Microorganisms:*  
no data available

*Toxicity to aquatic invertebrates:*  
no data available

**12.2. Persistence and degradability**

no data available

**12.3. Bioaccumulative potential**

no data available

**12.4. Mobility in soil**

no data available

**12.5. Results of PBT and vPvB assessment**

no data available

**12.6. Other adverse effects**

Accumulation in aquatic organisms is unlikely.

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**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

*Product:*  
Offer surplus and non-recyclable solutions to a licensed disposal company. Refer to manufacturer/supplier for information on recovery/recycling. Classification: 14.06.01

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### Further information:

Provisions relating to waste:

EC Directive 2006/12/EC; 2008/98/EEC

Regulation No. 1013/2006

For personal protection see section 8.

## SECTION 14: Transport information

### ADR/RID

UN Number : 3163  
Description of the goods : LIQUEFIED GAS, N.O.S.  
(1,1,1,2-TETRAFLUOROETHANE, DIFLUOROMETHANE,  
PENTAFLUOROETHANE)  
Class : 2  
Classification Code : 2A  
Hazard Identification : 20  
Number  
ADR/RID-Labels : 2.2  
Environmentally hazardous : no

### IATA

UN Number : 3163  
Description of the goods : Liquefied gas, n.o.s.  
(1,1,1,2-Tetrafluoroethane, Difluoromethane,  
Pentafluoroethane)  
Class : 2.2  
Hazard Labels : 2.2

### IMDG

UN Number : 3163  
Description of the goods : LIQUEFIED GAS, N.O.S.  
(1,1,1,2-TETRAFLUOROETHANE, DIFLUOROMETHANE,  
PENTAFLUOROETHANE)  
Class : 2.2  
Hazard Labels : 2.2  
EmS Number : F-C, S-V  
Marine pollutant : no

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### Poison Control Center

Country	Phone Number
Austria	+4314064343
Belgium	070 245245

Country	Phone Number
Latvia	+37167042473
Liechtenstein	no data available

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Bulgaria	(+)35929154233
Croatia	(+3851)23-48-342
Cyprus	no data available
Czech Republic	+420224919293; +420224915402
Denmark	82121212
Estonia	16662; (+372)6269390
Finland	9471977
France	+33(0)145425959
Greece	no data available
Hungary	(+36-80)201-199
Iceland	5432222
Ireland	+353(1)8092166
Italy	no data available
Germany	Berlin : 030/19240
	Bonn : 0228/19240
	Erfurt : 0361/730730
	Freiburg : 0761/19240
	Göttingen : 0551/19240
	Homburg : 06841/19240
	Mainz : 06131/19240
	Munich : 089/19240

Lithuania	+370532362052
Luxembourg	070245245; (+352)80002-5500
Malta	no data available
Netherlands	030-2748888
Norway	22591300
Poland	no data available
Portugal	808250143
Romania	no data available
Slovakia (NTIC)	+421 2 54 774 166
Slovenia	no data available
Spain	+34915620420
Sweden	112 (begär Giftinformation);+46104566786
United Kingdom	no data available

**Other inventory information**

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

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On the inventory, or in compliance with the inventory

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

**15.2 Chemical safety assessment**

A Chemical Safety Assessment has been carried out.

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**SECTION 16: Other information**

**Text of H-statements referred to under heading 3**

Norflurane	: H280	Contains gas under pressure; may explode if heated.
Pentafluoroethane	: H280	Contains gas under pressure; may explode if heated.
Difluoromethane	: H220 H280	Extremely flammable gas. Contains gas under pressure; may explode if heated.

**Further information**

All directives and regulations refer to amended versions.  
Vertical lines in the left hand margin indicate a relevant amendment from the previous version.

Abbreviations:

EC European Community  
CAS Chemical Abstracts Service  
DNEL Derived no effect level  
PNEC Predicted no effect level  
vPvB Very persistent and very bioaccumulative substance  
PBT Persistent, bioaccumulative und toxic substance

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.

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