

**Genetron Performax® LT (R-407F)**

10639660

Version 3.1

Revision Date 17.12.2022

Supersedes 2

**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 Advanced Limited      Honeywell International, Inc.  
Riverview House, Harvey's      115 Tabor Road  
Quay Apartments      Morris Plains, NJ 07950-2546  
V94 R3DE Limerick      USA  
Ireland  
Telephone : (353) 1 903 9302  
For further information, please contact: : PMTEU Product Stewardship:  
SafetyDataSheet@Honeywell.com

**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**

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

**2.2. Label elements**

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

|  |   |   |  |
|--|---|---|--|
| 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.       |
| Special labelling of certain products: | : | Contains fluorinated greenhouse gases.  |  |

**2.3. Other hazards**

Contains gas under pressure; may explode if heated.

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

**3.1. Substance**

Not applicable

**3.2. Mixture**

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| Chemical name     | CAS-No.<br>Index-No.<br>REACH Registration<br>Number<br>EC-No. | Classification 1272/2008                | Concentration     | Remarks |
|-------------------|--|---|-------------------|---------|
| Norflurane        | 811-97-2<br>212-377-0  | Press. Gas ; H280                       | >= 25 % - < 50 %  |         |
| Pentafluoroethane | 354-33-6<br>206-557-8  | Press. Gas ; H280                       | >= 25 % - < 50 %  |         |
| Difluoromethane   | 75-10-5<br>200-839-4   | Flam. Gas 1B; H221<br>Press. Gas ; H280 | >= 25 % - <= 50 % |         |

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.

**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:*

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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

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### 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

For personal protection see section 8.

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## 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

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*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<br>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/impact                         | Exposure duration | Value       | Exposure routes | Remarks |
|-------------------|--|-------------------|-------------|-----------------|---------|
| Norflurane        | Workers / Long-term systemic effects   |                   | 13936 mg/m3 | Inhalation      |         |
| Norflurane        | Consumers / Long-term systemic effects |                   | 2476 mg/m3  | Inhalation      |         |
| Pentafluoroethane | Workers / Long-term systemic effects   |                   | 16444 mg/m3 | Inhalation      |         |

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|                   |   |  |                           |            |  |
|-------------------|---|--|---------------------------|------------|--|
| Pentafluoroethane | Consumers /<br>Long-term<br>systemic<br>effects |  | 1753<br>mg/m <sup>3</sup> | Inhalation |  |
| Difluoromethane   | Workers /<br>Long-term<br>systemic<br>effects   |  | 7035<br>mg/m <sup>3</sup> | Inhalation |  |
| Difluoromethane   | Consumers /<br>Long-term<br>systemic<br>effects |  | 750 mg/m <sup>3</sup>     | Inhalation |  |

| Component         | Environmental compartment /<br>Value | Remarks                     |
|-------------------|--------------------------------------|-----------------------------|
| Norflurane        | Fresh water: 0,1 mg/l                | Assessment factor:<br>1000  |
| Norflurane        | Marine water: 0,01 mg/l              | Assessment factor:<br>10000 |
| Norflurane        | Fresh water sediment: 0,75 mg/kg     | Assessment factor:<br>100   |
| Norflurane        | Sewage treatment plant: 73 mg/l      | Assessment factor:<br>10    |
| Pentafluoroethane | Fresh water: 0,1 mg/l                | Assessment factor:<br>1000  |
| Pentafluoroethane | Fresh water sediment: 0,6 mg/kg dw   |                             |
| Difluoromethane   | Fresh water: 0,142 mg/l              | Assessment factor:<br>1000  |
| Difluoromethane   | Fresh water sediment: 0,534 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, 511; 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

|                |   |                            |
|----------------|---|----------------------------|
| Physical state | : | gaseous                    |
| Colour         | : | clear<br>and<br>colourless |
| Odour          | : | ether-like                 |
|                | : | No data available          |



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|  |   |  |
|--|---|--|
| Boiling point/boiling range            | : | -45,5 °C<br>at 1.013 hPa                             |
| Upper explosion limit                  | : | None   |
| Lower explosion limit                  | : | None   |
| Auto-ignition temperature              | : | No data available                                    |
| Decomposition temperature              | : | No data available                                    |
| pH                                     | : | neutral  |
| Water solubility                       | : | No data available                                    |
| Partition coefficient: n-octanol/water | : | log Pow 1,06<br>1,1,1,2-tetrafluoroethane (HFC-134a) |
| Partition coefficient: n-octanol/water | : | log Pow 1,48<br>Ethane, pentafluoro- (HFC-125)       |
| Vapour pressure                        | : | 10.218 hPa<br>at 21,1 °C                             |
| Density                                | : | No data available                                    |
| 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**

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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**

oxidising substances  
Possible incompatibility with alkali sensitive materials.  
Powdered metals

**10.6. Hazardous decomposition products**

Halogenated compounds  
Hydrogen fluoride  
Carbonyl halides  
Carbon oxides

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**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

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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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  
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

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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 $\geq$ : 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

*Aspiration hazard:*  
No data available

### 11.2. Information on other hazards

Endocrine disrupting properties  
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. Endocrine disrupting properties**

No data available

**12.7. 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

*Further information:*

Provisions relating to waste:  
EC Directive 2006/12/EC; 2008/98/EEC  
Regulation No. 1013/2006

For personal protection see section 8.

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**SECTION 14: Transport information**

**14.1 UN number**

ADR/RID:3163

IMDG:3163

IATA:3163

**14.2 UN proper shipping name**

ADR/RID:LIQUEFIED GAS, N.O.S.(1,1,1,2-TETRAFLUOROETHANE, DIFLUOROMETHANE, PENTAFLUROETHANE)

IMDG:LIQUEFIED GAS, N.O.S.(1,1,1,2-TETRAFLUROETHANE, DIFLUOROMETHANE, PENTAFLUROETHANE)

IATA:Liquefied gas, n.o.s.(1,1,1,2-Tetrafluoroethane, Difluoromethane, Pentafluoroethane)

**14.3 Transport hazard class(es)**

ADR/RID: 2.2

IMDG: 2.2

IATA: 2.2

**14.4 Packaging group**

**14.5 Environmental hazards**

ADR/RID:no

Marine pollutant: no

**14.6 Special precautions for user**

No data available

**14.7 Maritime transport in bulk according to IMO instruments**

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No data available

**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                   |
| Bulgaria            | (+35929154233                |
| Croatia             | (+3851)23-48-342             |
| Cyprus              | +357 2240 5611               |
| Czech Republic      | +420224919293; +420224915402 |
| Denmark             | 82121212                     |
| Estonia             | 16662; (+372)6269390         |
| Finland             | 9471977                      |
| France              | +33(0)145425959              |
| Greece              | +30 210 779 3777             |
| Hungary             | (+36-80)201-199              |
| Iceland             | 5432222                      |
| Ireland             | +353(1)8092166               |
| Italy               | 0382 24444                   |
| Germany             | Berlin : 030/19240           |
|                     | Bonn : 0228/19240            |
|                     | Erfurt : 0361/730730         |
|                     | Freiburg : 0761/19240        |
|                     | Göttingen : 0551/19240       |
|                     | Homburg : 06841/19240        |
| Mainz : 06131/19240 |                              |

| Country         | Phone Number   |
|-----------------|--|
| Liechtenstein   | +41 442515151  |
| Lithuania       | +370532362052  |
| Luxembourg      | 070245245; (+352)80002-5500                                |
| Malta           | +356 2395 2000   |
| Netherlands     | 030-2748888  |
| Norway          | 22591300   |
| Poland          | +48 42 25 38 400   |
| Portugal        | 800250250  |
| Romania         | +40 21 318 3606  |
| Slovakia (NTIC) | +421 2 54 774 166  |
| Slovenia        | +386 1 400 6051  |
| Spain           | +34915620420<br>112 (begär<br>Gifinformation);+46104566786 |
| Sweden          | 112 (begär<br>Gifinformation);+46104566786                 |
| Switzerland     | 145  |
| United Kingdom  | (+44) 844 892 0111   |

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|        |                    |
|--------|--------------------|
|        | Munich : 089/19240 |
| Latvia | +37167042473       |

**Other inventory information**

US. Toxic Substances Control Act  
On TSCA Inventory

Australia. Inventory of Industrial Chemicals (AIIC), as amended  
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. Existing Chemicals Inventory (KECI)  
On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS)  
On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances (IECSC)  
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

Taiwan Chemical Substance Inventory (TCSI)  
Not 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**



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Norflurane : H280 Contains gas under pressure; may explode if heated.

Difluoromethane : H221 Flammable gas.  
H280 Contains gas under pressure; may explode if heated.

Pentafluoroethane : H280 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.