

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.
Laarderhoogtweg 18
1101 EA Amsterdam
Netherlands
Telephone : (31) 020 5656911
Telefax : (31) 020 5656600
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


Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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:

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.

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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.

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

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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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Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

	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	

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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.

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

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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

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.

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Honeywell

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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_≥: 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

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

Aspiration hazard:
no data available

Other information:
Inhalation: May cause cardiac arrhythmia.

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.

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

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Honeywell

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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

Genetron Performax® LT (R-407F)

000000013866

Version 2.4

Revision Date 15.05.2017

Supersedes 1

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.

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.

Genetron Performax® LT (R-407F)

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Version 2.4

Revision Date 15.05.2017

Supersedes 1
