

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product information

Trade name : Genetron® 407C

Use of the Substance/Mixture : Refrigerant

Company/Undertaking Identification

Company : Honeywell Specialty Chemicals Seelze GmbH
Wunstorfer Straße 40
30926 Seelze

Telephone : (49) 5137-999 0
Telefax : (49) 5137-999 123
Emergency telephone number : (49) 5137-999 0(Seelze)
+1-703-527-3887(ChemTrec)
+1-651-523-0309(Medical PROSAR)

For further information, please contact: : PMTEU Product Stewardship:
SafetyDataSheet@Honeywell.com

2. HAZARDS IDENTIFICATION

Risk advice to man and the environment

This mixture is not classified as dangerous according to Directive 1999/45/EC.
Additional advice : Rapid evaporation of the liquid may cause frostbite.
High vapour concentrations can cause headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness.
May cause cardiac arrhythmia.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization

Chemical Name : Genetron® 407C

Hazardous components

Chemical Name	CAS-No.	EC-No.	Index-No.	Classification	Concentration
Norflurane	811-97-2	212-377-0			>= 50 - <= 100
Pentafluoroethane	354-33-6	206-557-8			>= 25 - < 50
Difluoromethane	75-10-5	200-839-4		F+; R12	>= 20 - < 25

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

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

4. FIRST AID MEASURES

- 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 : As this product is a gas, refer to the inhalation section.
Do not induce vomiting without medical advice.
Never give anything by mouth to an unconscious person.
Call a physician immediately.

Notes to physician

- Treatment : Do not give adrenaline or similar drugs.

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

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : The product is not flammable.
ASHRAE 34
Use water spray, alcohol-resistant foam, dry chemical or
carbon dioxide.
- Specific hazards during fire fighting : Possibility of generating hazardous reactions during a fire due
to the presence of F and Cl groups.
Heating will cause pressure rise with risk of bursting
Cool closed containers exposed to fire with water spray.
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.
- Special protective equipment for fire-fighters : Wear full protective clothing and self-contained breathing
apparatus.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : 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.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
The product evaporates readily.

For personal protection see section 8.

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

7. HANDLING AND STORAGE

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.

Storage

Further information on storage conditions : Store in original container.
Keep away from direct sunlight.
Keep containers tightly closed in a cool, well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure controls

Components	Basis	Value type	Control parameters	Exceeding Factor	Form of exposure	Remarks
Norflurane	EH40 WEL	time weighted average	4.240 mg/m ³ 1.000 ppm			
Pentafluoroethane	HONEYWELL	time weighted average	1.000 ppm			We are not aware of any national exposure limit.
Difluoromethane	WEEL	time weighted average	2.200 mg/m ³ 1.000 ppm			We are not aware of any national exposure limit.

Personal protective equipment

Respiratory protection : Remarks: In case of insufficient ventilation wear suitable respiratory equipment.

Hand protection : Glove material: Viton (R)
Break through time: > 240 min
Glove thickness: 0,7 mm
Vitoject 890
Heat insulating gloves
Remarks: Supplementary note: The specifications are based on information and tests from similar substances by analogy.

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

Due to varying conditions (e.g.temperature or other strains) it must be considered that the usage of a chemical protective glove in practice may be much shorter than the permeation time determined in accordance with EN 374.

Since actual conditions of practical use often deviate from standardised conditions according EN 374 the glove manufacturer recommends to use the chemical protective glove in practice not longer than 50% of the recommended permeation time.

Manufacturer's directions for use should be observed because of great diversity of types .

Suitable gloves tested according EN 374 are supplied e.g. from KCL GmbH, D-36124 Eichenzell, Vertrieb@kcl.de

- Eye protection : Safety glasses with side-shields conforming to EN166
Face-shield
- Skin and body protection : Protective footwear
- Protective measures : 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

- Form : Liquefied gas
- Colour : colourless
- Odour : slight
- molecular weight : Remarks: not applicable
not applicable

Safety data

- Boiling point/boiling range : -43,9 °C
- Flash point : Remarks: not applicable
- Vapour pressure : 10.769 hPa
at 21,1 °C
- Vapour pressure : 24.593 hPa
at 54,4 °C
- Density : 1,16 g/cm³
at 21,1 °C
- pH : Remarks: neutral
- Water solubility : 1,5 g/l

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Honeywell

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

Partition coefficient: n-octanol/water	:	log Pow 1,06 Medium: 1,1,1,2-tetrafluoroethane (HFC-134a)
Partition coefficient: n-octanol/water	:	log Pow 1,48 Medium: Ethane, pentafluoro- (HFC-125)
Relative vapour density	:	3 Remarks: (Air = 1.0)
Evaporation rate	:	> 1 Method: Compared to CCl ₄ .

10. STABILITY AND REACTIVITY

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.
Materials to avoid	:	oxidising substances Possible incompatibility with alkali sensitive materials. Powdered metals
Hazardous decomposition products	:	Halogenated compounds Hydrogen fluoride Carbonyl halides Carbon oxides
Thermal decomposition	:	>250 °C

11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity	:	LC50 Species: rat Dose: > 500000 ppm Exposure time: 4 h Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)
Acute inhalation toxicity	:	LC50 Species: rat Dose: 520000 ppm Exposure time: 4 h Test substance: Difluoromethane (HFC-32)
Acute inhalation toxicity	:	LC50 Species: rat Dose: > 800000 ppm Exposure time: 4 h Test substance: Ethane, pentafluoro- (HFC-125)
Repeated dose toxicity	:	Species: rat

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

Information derived from practical experience. : Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)
Remarks: NOEL – 40,000 ppm
: Inhalation: May cause cardiac arrhythmia.
Ingestion: No hazards to be specially mentioned.
Skin contact: Rapid evaporation of the liquid may cause frostbite. Irritating to skin.
Eye contact: Irritating to eyes.
1,1,1,2-tetrafluoroethane (HFC-134a): Cardiac sensitisation threshold (dog): 80000 ppm.
Ethane, pentafluoro- (HFC-125): Cardiac sensitisation threshold (dog): 75000 ppm.
Difluoromethane. (HFC-32): Cardiac sensitisation threshold (dog): 350000 ppm.

12. ECOLOGICAL INFORMATION

Ozone Depletion Potential: : 0
Global warming potential (GWP) : 1.653
Additional ecological information : Accumulation in aquatic organisms is unlikely.

13. DISPOSAL CONSIDERATIONS

Product : Offer surplus and non-recyclable solutions to a licensed disposal company.
Refer to manufacturer/supplier for information on recovery/recycling.
Remarks : To present knowledge of the supplier, this product is not regarded as hazardous waste as defined by EU Directive 91/689/EC.
Waste key for the unused product : Classification: 14.06.01

14. TRANSPORT INFORMATION

ADR
UN Number : 3340
Description of the goods : REFRIGERANT GAS R 407C
Class : 2
Classification Code : 2A
Hazard identification No : 20
ADR/RID-Labels : 2.2

IATA
UN Number : 3340
Description of the goods : Refrigerant gas R 407C

Genetron® 407C

Version 1.8

Revision Date 19.04.2011

Print Date 13.07.2012

Class : 2.2
Hazard Labels : 2.2
Packing instruction (cargo aircraft) : 200
Packing instruction (passenger aircraft) : 200

IMDG

UN Number : 3340
Description of the goods : REFRIGERANT GAS R 407C
Class : 2.2
Hazard Labels : 2.2
EmS Number : F-C
Marine pollutant : no

RID

UN Number : 3340
Description of the goods : REFRIGERANT GAS R 407C
Class : 2
Classification Code : 2A
Hazard identification No : 20
ADR/RID-Labels : 2.2

15. REGULATORY INFORMATION

Labelling according to EC Directives 1999/45/EC

S-phrase(s) : S47/49 Keep only in the original container at a temperature not exceeding 50 °C.

Other regulations : For industrial use only.
Restricted to professional users.
EU Regulation 842/2006/EC

16. OTHER INFORMATION

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.