

## Genetron® 404A

Version 1.7

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® 404A

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® 404A

#### Hazardous components

Chemical Name	CAS-No.	EC-No.	Index-No.	Classification	Concentration
1,1,1-Trifluoroethane	420-46-2	206-996-5		F+; R12	>= 50 - <= 100
Pentafluoroethane	354-33-6	206-557-8			>= 30 - <= 50
Norflurane	811-97-2	212-377-0			>= 3 - < 5

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® 404A**

Version 1.7

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**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.

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**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.

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**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® 404A**

Version 1.7

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 <sup>3</sup> 1.000 ppm			

**Personal protective equipment**

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

Hand protection : Glove material: Viton (R)  
Break through time: > 480 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. 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

**Genetron® 404A**

Version 1.7

Revision Date 19.04.2011

Print Date 13.07.2012

- 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 : weak
- molecular weight : Remarks: not applicable

**Safety data**

- Boiling point/boiling range : -47,8 °C
- Flash point : Remarks: not applicable
- Vapour pressure : 12.610 hPa  
at 21,1 °C
- Vapour pressure : 25.572 hPa  
at 54,4 °C
- Density : 1,08 g/cm<sup>3</sup>  
at 21,1 °C
- pH : Remarks: neutral
- Water solubility : Remarks: Very slightly soluble in cold water, hot water.
- Partition coefficient: n-  
octanol/water : log Pow 1,06  
Medium: 1,1,1,2-tetrafluoroethane (HFC-134a)
- Relative vapour density : 3,43  
Remarks: (Air = 1.0)
- Evaporation rate : > 1  
Method: Compared to CCl<sub>4</sub>.

**Genetron® 404A**

Version 1.7

Revision Date 19.04.2011

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**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
- Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as:  
Gaseous hydrogen fluoride (HF).  
Carbonyl halides  
Carbon monoxide  
Carbon dioxide (CO<sub>2</sub>)
- Thermal decomposition : >250 °C

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**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)
- Information derived from practical experience. : 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-trifluoroethane (HFC-143a): Cardiac sensitisation threshold (dog): >250000 ppm.  
Ethane, pentafluoro- (HFC-125): Cardiac sensitisation threshold (dog): 75000 ppm.  
1,1,1,2-tetrafluoroethane (HFC-134a): Cardiac sensitisation threshold (dog): 80000 ppm.
- Further information : Remarks: 1,1,1-trifluoroethane (HFC-143a): Not mutagenic in AMES Test. May cause cardiac arrhythmia. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

**Genetron® 404A**

Version 1.7

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**12. ECOLOGICAL INFORMATION**

Ozone Depletion Potential: : 0

Global warming potential (GWP) : 3.784

Additional ecological information : Accumulation in aquatic organisms is unlikely.

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**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

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**14. TRANSPORT INFORMATION**

**ADR**

UN Number : 3337  
Description of the goods : REFRIGERANT GAS R 404A  
Class : 2  
Classification Code : 2A  
Hazard identification No : 20  
ADR/RID-Labels : 2.2

**IATA**

UN Number : 3337  
Description of the goods : Refrigerant gas R 404A  
Class : 2.2  
Hazard Labels : 2.2  
Packing instruction (cargo aircraft) : 200  
Packing instruction (passenger aircraft) : 200

**IMDG**

UN Number : 3337  
Description of the goods : REFRIGERANT GAS R 404A  
Class : 2.2  
Hazard Labels : 2.2  
EmS Number : F-C  
Marine pollutant : no

**Genetron® 404A**

Version 1.7

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Print Date 13.07.2012

**RID**

UN Number : 3337  
Description of the goods : REFRIGERANT GAS R 404A  
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.