

**SAFETY DATA SHEET****Honeywell****R-404A****1. Identification of the substance/preparation and of the company/undertaking****Identification of the substance or preparation**

**Product name** : R-404A  
**Use of the substance/preparation** : Refrigerant.  
**Company/undertaking identification**  
**Supplier** : Honeywell Fluorine  
 Products Europe B.V.  
 Kempenweg 90  
 6002 SX Weert, The Netherlands  
 Tel: +31-495-514200  
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**Emergency telephone number** : (32) 16 391 391

**2. Composition/information on ingredients****Substance/Preparation** : Preparation

Ingredient Name	CAS number	%	EC Number	Classification
<b>United Kingdom (UK)</b> 1,1,1-trifluoroethane. (HFC-143a) Ethane, pentafluoro- (HFC-125) 1,1,1,2-tetrafluoroethane. (HFC-134a) See Section 16 for the full text of the R Phrases declared above	420-46-2 354-33-6 811-97-2	52 44 4	206-996-5 206-557-8 212-377-0	R10

\* Occupational Exposure Limit(s), if available, are listed in Section 8

**3. Hazards identification**

The preparation is not classified as dangerous according to Directive 1999/45/EC and its amendments.

**Additional Hazards** : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite. High vapour concentrations can cause headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. Heartbeat irregularity (arrhythmia).

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

**4. First aid measures****First aid measures**

**Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

**Ingestion** : As this product is a gas, refer to the inhalation section. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact** : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite. In case of contact with liquid, warm frozen tissues with water and get medical attention. Remove contaminated clothing and shoes. Wash clothing before reuse.

**Eye contact** : Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. If irritation persists, get medical attention.

**Notes to physician** : Do not give adrenaline or similar drugs.

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

## 5. Fire-fighting measures

- Extinguishing media** : Non-flammable. ASHRAE 34.  
In case of fire, use water spray (fog), foam, dry chemical or CO<sub>2</sub> extinguisher or spray.
- Special exposure hazards** : Possibility of generating hazardous reactions during a fire due to the presence of F and/or Cl groups. In a fire or if heated, a pressure increase will occur and the container may burst. Use water spray to keep fire-exposed containers cool. 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.
- Hazardous thermal decomposition products** : These products are carbon oxides (CO, CO<sub>2</sub>), halogenated compounds, hydrogen fluoride, carbonyl halides.
- Decomposition Temperature** : >250°C (482°F)
- Special protective equipment for fire-fighters** : Fire-fighters should wear self-contained positive pressure breathing apparatus (SCBA) and full turnout gear.

## 6. Accidental release measures

- Personal Precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Provide adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment.
- Environmental precautions and cleanup methods** : Stop leak if without risk. Spillages may evaporate rapidly.

**Note:** See section 8 for personal protective equipment and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Exercise caution when opening to allow pressure release. Store and use away from heat, sparks, open flame, or any other ignition source. Pressurised container: protect from sunlight and do not expose to temperature exceeding 50°C. Do not pierce or burn, even after use. Provide adequate ventilation. Wash thoroughly after handling.
- Storage** : Store in original container, protected from direct sunlight. Keep container tightly closed in a cool, well-ventilated place.
- Packaging materials**
- Recommended** : Use original container.

## 8. Exposure controls/personal protection

<u>Ingredient Name</u>	<u>Occupational Exposure Limits</u>
<b>United Kingdom (UK)</b>	
1,1,1-trifluoroethane. (HFC-143a)	<b>Honeywell (United Kingdom (UK)).</b> TWA: 1000 ppm 8 hour(s). <b>AIHA WEEL (United Kingdom (UK), 2002).</b> TWA: 1000 ppm 8 hour(s).
Ethane, pentafluoro- (HFC-125)	<b>Honeywell (United Kingdom (UK)).</b> TWA: 1000 ppm 8 hour(s). <b>AIHA WEEL (United Kingdom (UK), 2002).</b> TWA: 1000 ppm 8 hour(s).
1,1,1,2-tetrafluoroethane. (HFC-134a)	<b>EH40-OES (United Kingdom (UK), 2002).</b> STEL: 9740 mg/m <sup>3</sup> 15 minute(s). STEL: 1250 ppm 15 minute(s). TWA: 4240 mg/m <sup>3</sup> 8 hour(s). TWA: 1000 ppm 8 hour(s).

### Exposure Controls and Personal Protection

- Occupational exposure controls** : Provide adequate ventilation. Do not enter storage areas and confined spaces unless adequately ventilated.
- Respiratory protection** : In case of insufficient ventilation, wear suitable respiratory equipment.  
Recommended: supplied-air respirator.
- Hand protection** : Insulated gloves suitable for low temperatures  
Recommended: butyl rubber

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- Eye protection** : Recommended: safety glasses with side shields, splash goggles.  
Possible: face shield.
- Skin protection** : Recommended: overall. Suitable protective footwear.

## 9. Physical and chemical properties

### General information

#### Appearance

- Physical state** : Gas. (Liquefied gas.)
- Colour** : Colourless.
- Odour** : Slight.
- Molecular Weight** : Not applicable.

### Important health, safety and environmental information

- Boiling point** : -47.8°C (-54°F)
- Flash point** : Not applicable.
- Relative density** : 1.08 g/cm<sup>3</sup>
- Solubility** : Very slightly soluble in cold water, hot water.
- Vapour density** : 3.43 (Air = 1)
- Evaporation rate** : >1 compared to CCl<sub>4</sub>

### Other information

- Decomposition Temperature** : >250°C (482°F)

## 10. Stability and reactivity

- Stability** : The product is stable. Hazardous Polymerisation : Will not occur.
- Conditions to Avoid** : In a fire or if heated, a pressure increase will occur and the container may burst. Pressurised container: protect from sunlight and do not expose to temperature exceeding 50°C. Do not pierce or burn, even after use.
- Decomposition Temperature** : >250°C (482°F)
- Materials to avoid** : Strong oxidising materials. Incompatible with magnesium, zinc, sodium, potassium and aluminium.  
Incompatibility is more severe if the metal is present as dust or powder or has freshly exposed surfaces.
- Hazardous Decomposition Products** : These products are halogenated compounds, hydrogen fluoride, carbon oxides (CO, CO<sub>2</sub>), carbonyl halides.

## 11. Toxicological information

### Potential Acute Health Effects

- Inhalation** : Heartbeat irregularity (arrhythmia).
- Ingestion** : No specific hazard.
- Skin Contact** : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite. Slightly irritating to the skin.
- Eye contact** : Slightly irritating to the eyes.

### Acute toxicity

- | <u>Ingredient Name</u>                   | <u>Test</u> | <u>Result</u>              | <u>Route</u> | <u>Species</u> |
|--|-------------|----------------------------|--------------|----------------|
| 1,1,1,2-tetrafluoroethane.<br>(HFC-134a) | LC50        | >500000 ppm (4<br>hour(s)) | Inhalation   | Rat            |
- Remarks** : **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.

- Mutagenicity / Teratogenic Effect.** : **1,1,1-trifluoroethane. (HFC-143a)**: Not mutagenic in AMES test.

### Over-exposure signs/symptoms

## 12. Ecological information

### Other Ecological Information

Ingredient Name	Persistence/degradability						Bioaccumulative potential		
	BOD <sub>5</sub>	COD	ThOD	Aquatic Half-life	Photolysis	Biodegradability	LogP <sub>ow</sub>	BCF	Potential
1,1,1,2-tetrafluoroethane. (HFC-134a)							1.06		low

Ozone Depleting Potential (ODP) : 0

(R-11 = 1)

Global Warming Potential : 3260

(GWP)

Mobility : Practically non-toxic to aquatic organisms.

## 13. Disposal considerations

**Methods of disposal** : Dispose of surplus and non-recyclable products via a licensed waste disposal company. Refer to manufacturer/supplier information on recovery/recycling.





**Waste Classification** : Not applicable.

**European Waste Catalogue (EWC)** : Not available.

**Hazardous Waste** : To present knowledge of the supplier, this product is not regarded as hazardous waste as defined by EU Directive 91/689/EC.

## 14. Transport information

### International transport regulations

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional Information
ADR/RID Class	UN3337	Refrigerant gases, R404a	2	-		<b>Hazard identification number</b> 20
ADN Class	UN3337	Refrigerant gases, R404a	2	-		-
IMDG Class	UN3337	Refrigerant gases, R404a	2.2	-		<b>Emergency Schedules (EmS)</b> 2-09
IATA-DGR Class	UN3337	Refrigerant gases, R404a	2.2	-		-

## 15. Regulatory information

### EU Regulations

**Risk phrases** : This product is not classified according to the EU regulations.

**Product Use** : Classification and labelling have been performed according to EU directives 67/548/EEC, 1999/45/EC, including amendments and the intended use.  
- Industrial use only.

**Additional Warning Phrases** : Safety data sheet available for professional user on request.

## 16. Other information

### HISTORY

**Date of printing** : 9/30/2003.  
**Date of issue** : 9/30/2003.  
**Date of previous issue** : No Previous Validation.  
**Version** : 1.00  
**Prepared by** : Honeywell EHS department  
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### Notice to Reader

*To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.*

*Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.*

Version

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