

SAFETY DATA SHEET**Honeywell****R-408A****1. Identification of the substance/preparation and of the company/undertaking****Identification of the substance or preparation**

Product name : R-408A
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
 Fax: +31-495-518259
Emergency telephone number : (32) 16 391 391

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

Ingredient Name	CAS number	%	EC Number	Classification
United Kingdom (UK) Chlorodifluoromethane. (HCFC-22) 1,1,1-trifluoroethane. (HFC-143a) Ethane, pentafluoro- (HFC-125) See Section 16 for the full text of the R Phrases declared above	75-45-6 420-46-2 354-33-6	47 46 7	200-871-9 206-996-5 206-557-8	N; R59 R10

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

3. Hazards identification

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : N; R59
Environmental hazards : Dangerous for the ozone layer.
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.

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5. Fire-fighting measures

- Extinguishing media** : Non-flammable.
ASHRAE 34.
In case of fire, use water spray (fog), foam, dry chemical or CO₂ 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, CO₂), 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>
United Kingdom (UK)	
Chlorodifluoromethane. (HCFC-22)	EH40-OES (United Kingdom (UK), 2002). STEL: 9740 mg/m ³ 15 minute(s). STEL: 1250 ppm 15 minute(s). TWA: 3590 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s).
1,1,1-trifluoroethane. (HFC-143a)	Honeywell (United Kingdom (UK)). TWA: 1000 ppm 8 hour(s). AIHA WEEL (United Kingdom (UK), 2002). TWA: 1000 ppm 8 hour(s).
Ethane, pentafluoro- (HFC-125)	Honeywell (United Kingdom (UK)). TWA: 1000 ppm 8 hour(s). AIHA WEEL (United Kingdom (UK), 2002). 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** : -44°C (-47.2°F)
- Flash point** : Not available.
- Relative density** : 1.07 g/cm³
- Solubility** : Water: 0.15 g/100 ml.
- Vapour density** : 3.25 (Air = 1)
- Evaporation rate** : >1 compared to CCl₄

Other information

- Auto-ignition temperature** : The lowest known value is 750°C (1382°F) (1,1,1-trifluoroethane. (HFC-143a)).
- 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, CO₂), 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>
Chlorodifluoromethane. (HCFC-22)	LC50	>300000 ppm (4 hour(s))	Inhalation	Rat
1,1,1-trifluoroethane. (HFC-143a)	LC50	>250000 ppm (4 hour(s))	Inhalation	Rat
Ethane, pentafluoro- (HFC-125)	LC50	>800000 ppm (4 hour(s))	Inhalation	Rat

- Remarks** : **Chlorodifluoromethane. (HCFC-22)**: Cardiac sensitisation threshold (dog): 50000 ppm.
Ethane, pentafluoro- (HFC-125): Cardiac sensitisation threshold (dog): 75000 ppm.

- Subchronic exposure, no-observed-effect level (NOEL)** : > 10000 ppm (Rat).

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

Over-exposure signs/symptoms

Target Organs : May cause damage to the following organs: heart.

12. Ecological information**Other Ecological Information**

<u>Ingredient Name</u>	<u>Persistence/degradability</u>						<u>Bioaccumulative potential</u>		
	<u>BOD₅</u>	<u>COD</u>	<u>ThOD</u>	<u>Aquatic Half-life</u>	<u>Photolysis</u>	<u>Biodegradability</u>	<u>LogP_{ow}</u>	<u>BCF</u>	<u>Potential</u>
Chlorodifluoromethane. (HCFC-22)							1.08 to 1.13		low
Ethane, pentafluoro- (HFC-125)							1.48		low

Ozone Depleting Potential (ODP) : 0.026

(R-11 = 1)

Global Warming Potential (GWP) : 2650

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 : The classification of the product may meet the criteria for a hazardous waste

14. Transport information**International transport regulations**

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional Information
ADR/RID Class	UN3163	Liquefied gas n.o.s. (Chlorodifluoromethane., 1,1,1-trifluoroethane., Ethane, pentafluoro-)	2	-		-
ADN Class	UN3163	Liquefied gas n.o.s. (Chlorodifluoromethane., 1,1,1-trifluoroethane., Ethane, pentafluoro-)	2	-		-
IMDG Class	UN3163	Liquefied gas n.o.s. (Chlorodifluoromethane., 1,1,1-trifluoroethane., Ethane, pentafluoro-)	2.2	-		-
IATA-DGR Class	UN3163	Liquefied gas n.o.s. (Chlorodifluoromethane., 1,1,1-trifluoroethane., Ethane, pentafluoro-)	2.2	-		-

15. Regulatory information

EU Regulations

Hazard symbol(s)

:



Dangerous for the environment

Risk phrases

: R59- Dangerous for the ozone layer.

Safety Phrases

: S29- Do not empty into drains.

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.

Warning: The use of this product may be subject to use restrictions pursuant to EU Regulation 2037/2000. For more information, consult your supplier.

16. Other information

Full text of R phrases referred to in Sections 2 and 3 - United Kingdom (UK) : R10- Flammable.
R59- Dangerous for the ozone layer.

Full text of classifications referred to in Sections 2 and 3 - United Kingdom (UK) : N - Dangerous for the environment.

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Notice to Reader

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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.

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