

## 1. Identification of the Substance/Preparation and the Company

### Product Identifier:

- **Product Name:** R404A
- **Chemical Name:** Mixture of Pentafluoroethane (HFC-125), 1,1,1-Trifluoroethane (HFC-143a), and 1,1,1,2-Tetrafluoroethane (HFC-134a)
- **Synonyms:** Forane 404A, Genetron AZ-50, Suva 404A
- **CAS Numbers:**
  - Pentafluoroethane: 354-33-6
  - 1,1,1-Trifluoroethane: 420-46-2
  - 1,1,1,2-Tetrafluoroethane: 811-97-2
- **EC Numbers:**
  - Pentafluoroethane: 206-557-8
  - 1,1,1-Trifluoroethane: 206-996-5
  - 1,1,1,2-Tetrafluoroethane: 212-377-0
- **REACH Registration Number:** Not applicable (mixture)

### Relevant Identified Uses of the Substance:

- Refrigerant gas for commercial and industrial refrigeration and air conditioning systems.

### Details of the Supplier of the SDS:

- **Company Name:** Gaslogic B.V.
- **Address:** Overschiesweg 105, 3044 EH, Rotterdam.
- **Telephone Number:** +31 103 22 09 94
- **Email Address:** info@gaslogic.nl

### Emergency Telephone Number:

- +44 344 892 0111 (Available 24 hours)

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## 2. Hazards Identification

### 2.1 Classification of the Substance

#### According to Regulation (EC) No 1272/2008 (CLP):

- **Physical Hazards:**
  - Gases Under Pressure – Liquefied Gas (H280)
- **Health Hazards:**
  - Not classified as hazardous.
- **Environmental Hazards:**
  - Not classified as hazardous.

### 2.2 Label Elements

- **Pictogram:**



- **Signal Word:** Warning
- **Hazard Statements:**
  - **H280:** Contains gas under pressure; may explode if heated.
- **Precautionary Statements:**
  - **P210:** Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
  - **P377:** Leaking gas fire: Do not extinguish unless leak can be stopped safely.
  - **P410 + P403:** Protect from sunlight. Store in a well-ventilated place.

## 2.3 Other Hazards

- **Frostbite risk:** Contact with the liquid form can cause cold burns or frostbite.
- **Asphyxiation risk:** High concentrations can displace oxygen in confined spaces, leading to suffocation.

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## 3. Composition / Information on Ingredients

Substance	CAS Number	EC Number	Concentration (%)
Pentafluoroethane (HFC-125)	354-33-6	206-557-8	44%
1,1,1-Trifluoroethane (HFC-143a)	420-46-2	206-996-5	52%
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	212-377-0	4%

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## 4. First Aid Measures

### 4.1 Description of First Aid Measures

- **Inhalation:**
  - Move the affected person to fresh air immediately.
  - If breathing is difficult, administer oxygen.
  - Seek medical attention if symptoms such as dizziness, headache, or nausea persist.
- **Skin Contact:**
  - In case of skin contact with liquid refrigerant, flush the area with lukewarm water.
  - Do not rub the skin; seek medical attention for frostbite.
- **Eye Contact:**
  - Immediately flush eyes with lukewarm water for at least 15 minutes.
  - Seek medical attention if irritation persists or injury is suspected.
- **Ingestion:**
  - Ingestion is not considered a likely route of exposure due to the gaseous state.
  - If ingestion occurs, seek immediate medical attention.

### 4.2 Most Important Symptoms and Effects

- **Acute effects:** Dizziness, headache, nausea, and confusion due to inhalation.
- **Skin exposure:** Frostbite or cold burns from contact with liquid refrigerant.

### 4.3 Indication of Immediate Medical Attention

- Immediate medical attention is required for frostbite or in cases of high inhalation exposure leading to asphyxiation.

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## 5. Fire-Fighting Measures

### 5.1 Extinguishing Media

- **Suitable Extinguishing Media:** Use CO<sub>2</sub>, dry chemical, or water spray.
- **Unsuitable Extinguishing Media:** Do not use water jets, as they may spread the fire.

### 5.2 Special Hazards Arising from the Substance

- **Explosion risk:** Containers may explode when exposed to heat or fire.
- **Toxic gases:** Burning may release toxic gases such as hydrogen fluoride and carbonyl fluoride.

### 5.3 Advice for Firefighters

- Wear self-contained breathing apparatus (SCBA) and full protective clothing.
- Cool exposed containers with water spray to prevent explosions.

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## 6. Accidental Release Measures

### 6.1 Personal Precautions, Protective Equipment, and Emergency Procedures

- Evacuate the area and ensure proper ventilation.
- Wear personal protective equipment (PPE), including cold-resistant gloves and eye protection.
- Eliminate ignition sources and avoid sparks.

**6.2 Environmental Precautions**

- Avoid release into the environment, especially into water bodies or drains.
- Ensure adequate ventilation to allow gas to disperse.

**6.3 Methods and Material for Containment and Cleaning Up**

- Stop the leak if it is safe to do so.
- Allow the gas to disperse in a well-ventilated area.

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**7. Handling and Storage****7.1 Precautions for Safe Handling**

- Avoid inhalation of gas and vapors.
- Ensure good ventilation in enclosed areas.
- Keep away from heat, sparks, and open flames.

**7.2 Conditions for Safe Storage**

- Store in a cool, dry, well-ventilated area away from direct sunlight.
- Keep containers upright and properly secured to prevent movement or damage.
- Ensure that containers are properly labeled and closed.

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**8. Exposure Controls / Personal Protection****8.1 Control Parameters**

Substance	Occupational Exposure Limits (OELs)
Pentafluoroethane (HFC-125)	Not established
1,1,1-Trifluoroethane (HFC-143a)	Not established
1,1,1,2-Tetrafluoroethane (HFC-134a)	1,000 ppm (TWA)

**8.2 Exposure Controls****Engineering Controls:**

- Use local exhaust ventilation in confined or enclosed areas.
- Install gas detection systems to monitor potential leaks.

**Personal Protective Equipment:**

- **Respiratory Protection:** Use an approved respirator if exposure limits are exceeded.
- **Hand Protection:** Use cold-resistant gloves when handling liquid refrigerant.
- **Eye Protection:** Wear safety goggles or a face shield when handling liquid refrigerant.
- **Skin Protection:** Wear protective clothing to avoid skin exposure.

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**9. Physical and Chemical Properties**

Property	Value
Physical State	Gas at ambient temperature
Appearance	Colorless gas
Odor	Slight ethereal odor
Melting Point	Not available
Boiling Point	-46.5°C
Flash Point	Not applicable
Vapor Pressure	12,400 kPa at 25°C
Vapor Density	3.5 (air = 1)
Solubility in Water	Slight
Partition Coefficient (Kow)	Not available
Auto-ignition Temperature	750°C
Decomposition Temperature	>400°C

**10. Stability and Reactivity****10.1 Reactivity**

- Not reactive under normal conditions.

**10.2 Chemical Stability**

- Stable under recommended storage and handling conditions.

**10.3 Possibility of Hazardous Reactions**

- No hazardous reactions are expected under normal use.

**10.4 Conditions to Avoid**

- Avoid exposure to heat, sparks, open flames, and direct sunlight.

**10.5 Incompatible Materials**

- Strong oxidizers and alkali metals.

**10.6 Hazardous Decomposition Products**

- Thermal decomposition may release toxic gases such as hydrogen fluoride and carbonyl fluoride.

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**11. Toxicological Information****11.1 Information on Toxicological Effects****Acute Toxicity:**

- **Inhalation:** May cause dizziness, drowsiness, or asphyxiation at high concentrations.
- **Skin and Eye Contact:** Contact with liquid refrigerant may cause frostbite or cold burns.

**Skin Corrosion/Irritation:**

- Frostbite or cold burns may occur from direct contact with liquid refrigerant.

**Serious Eye Damage/Irritation:**

- Contact with liquid refrigerant may cause serious eye damage.

**Respiratory or Skin Sensitization:**

- Not classified as a sensitizer.

**Carcinogenicity:**

- Not classified as carcinogenic by IARC, NTP, or OSHA.

**Germ Cell Mutagenicity:**

- Not classified as mutagenic.

**Reproductive Toxicity:**

- Not classified as toxic to reproduction.

**STOT – Single Exposure:**

- May cause dizziness, drowsiness, and respiratory irritation due to inhalation of high concentrations.

**Aspiration Hazard:**

- Not applicable (gaseous state).

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**12. Ecological Information****12.1 Toxicity**

- Low toxicity to aquatic organisms.
  - **LC50 (Fish, 96h):** Not available
  - **EC50 (Daphnia, 48h):** Not available

**12.2 Persistence and Degradability**

- The components of this product are expected to persist in the atmosphere and contribute to global warming.

**12.3 Bioaccumulative Potential**

- Low bioaccumulation potential due to high volatility.

**12.4 Mobility in Soil**

- Highly volatile, expected to partition into the atmosphere.

**12.5 Results of PBT and vPvB Assessment**

- Not classified as Persistent, Bioaccumulative, and Toxic (PBT) or very Persistent and very Bioaccumulative (vPvB).

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**13. Disposal Considerations****13.1 Waste Treatment Methods**

- **Product Disposal:** Recover or recycle if possible. Dispose of in accordance with local, regional, and national regulations.
- **Packaging Disposal:** Empty containers should be returned to the supplier for recycling or disposal according to local regulations.

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**14. Transport Information (Extended Chapter)****14.1 UN Number**

- **UN 3337**

**14.2 UN Proper Shipping Name**

- **Refrigerant Gas R404A**

**14.3 Transport Hazard Class(es)**

- **Class 2.2 (Non-flammable Gas)**

**14.4 Packing Group**

- Not applicable (gases do not require packing groups).

**14.5 Environmental Hazards**

- **Not classified as a marine pollutant** under IMDG.
- However, steps should be taken to avoid contamination of the environment with large releases.

**14.6 Special Precautions for User**

- Ensure proper ventilation during transport, especially in enclosed or confined spaces.
- Cylinders must be secured during transport to prevent movement and should be transported upright.
- Use only approved gas cylinders for transport, and ensure they are properly labeled with the UN number, hazard class, and correct shipping name.

**14.7 Transport in Bulk According to Annex II of MARPOL and the IBC Code**

- Not applicable, as this substance is transported in cylinders and not in bulk.

**14.8 Additional Transport Information****Transport by Road/Rail (ADR/RID):**

- **Classification Code:** 2A
- **Tunnel Restriction Code:** (C/E) – Prohibited in tunnels of category C when transported in bulk.

**Transport by Sea (IMDG):**

- **EMS Code:** F-C, S-V
- **Stowage:** Keep away from heat sources and store in well-ventilated areas. Ensure proper stowage away from combustibles.

**Transport by Air (IATA):**

- **Packing Instruction:** 200
- **Passenger Aircraft:** Limited to smaller quantities.
- **Cargo Aircraft Only:** Larger quantities are allowed, but ensure that ventilation is adequate.

**Special Handling Instructions:**

- Ensure that personnel involved in the transport of R404A are trained in the handling of compressed gases and are aware of emergency procedures in case of leaks or exposure.
- Inspect cylinders for any potential leaks or damage before transport. Ensure they are equipped with pressure relief devices where applicable.
- Ensure compliance with all local and international regulations governing the transport of compressed gases.

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## 15. Regulatory Information

### 15.1 Safety, Health, and Environmental Regulations/Legislation Specific for the Substance

- **EU Regulations:**
  - **REACH Registration:** Components are registered under REACH.
  - **CLP Regulation (EC) No 1272/2008:** Classified and labeled according to CLP regulation.
  - **F-gas Regulation:** Subject to restrictions under the F-gas regulation.

### 15.2 Chemical Safety Assessment

- A chemical safety assessment has not been conducted for this mixture.

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## 16. Other Information

### Key Abbreviations:

- **PBT:** Persistent, Bioaccumulative, Toxic
- **vPvB:** Very Persistent, Very Bioaccumulative
- **LC50:** Lethal Concentration for 50% of organisms
- **EC50:** Effective Concentration for 50% of organisms

### Training Advice:

- Personnel handling R404A should be trained in proper handling, emergency response, and storage procedures, especially for dealing with pressurized gases.

### Disclaimer:

- The information provided in this SDS is correct to the best of our knowledge and is based on available information at the time of publication. This SDS is intended to provide guidance for safe handling, use, processing, storage, transportation, and disposal. It should not be considered a guarantee of any specific properties of the product.