1. Identification of the Substance/Preparation and the Company

Product Identifier:

- **Product Name:** R417A
- **Chemical Name:** Mixture of Pentafluoroethane (HFC-125), 1,1,1,2-Tetrafluoroethane (HFC-134a), and n-Butane
- **Synonyms:** Freon 417A, Isceon MO59
- **CAS Numbers:**
  - HFC-125: 354-33-6
  - HFC-134a: 811-97-2
  - n-Butane: 106-97-8
- **EC Numbers:**
  - HFC-125: 206-557-8
  - HFC-134a: 212-377-0
  - n-Butane: 203-448-7
- **REACH Registration Number:** Not applicable (mixture)

Relevant Identified Uses of the Substance:

- Refrigerant gas in air conditioning and refrigeration systems, typically used as a replacement for R22.

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)
  - Flammable Gas (H220)
- **Health Hazards:**
  - Not classified as hazardous.
- **Environmental Hazards:**
  - Not classified as hazardous.

2.2 Label Elements

- **Pictogram:**

- **Signal Word:** Danger
- **Hazard Statements:**
  - **H220:** Extremely flammable gas.
  - **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

- **Risk of frostbite:** Contact with the liquid can cause cold burns or frostbite.
- **Asphyxiation risk:** High concentrations may 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	46.6%
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	212-377-0	50%
n-Butane (C_4H_{10})	106-97-8	203-448-7	3.4%

Impurities: No significant impurities affecting the classification of the product.

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4. First Aid Measures

4.1 Description of First Aid Measures

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

4.2 Most Important Symptoms and Effects

- **Acute symptoms:** Dizziness, headache, nausea, and confusion caused by inhalation of vapors.
- **Skin contact:** Frostbite or cold burns from contact with liquid refrigerant.

4.3 Indication of Immediate Medical Attention

- Immediate medical attention is required for frostbite or high inhalation exposure causing asphyxia.

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5. Fire-Fighting Measures

5.1 Extinguishing Media

- **Suitable Extinguishing Media:** Use CO_2, dry chemical, or water spray.
- **Unsuitable Extinguishing Media:** Avoid direct water jets.

5.2 Special Hazards Arising from the Substance

- **Explosion risk:** Containers may explode if heated.
- **Toxic gases:** Burning may produce hydrogen fluoride and carbonyl fluoride.

5.3 Advice for Firefighters

- Wear self-contained breathing apparatus (SCBA) and full protective gear.
- Cool 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 appropriate personal protective equipment (PPE), including gloves and goggles.
- Eliminate all sources of ignition.

6.2 Environmental Precautions

- Avoid discharge into water sources or drains.
- Ventilate the area to allow the gas to dissipate.

6.3 Methods and Material for Containment and Cleaning Up

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

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7. Handling and Storage

7.1 Precautions for Safe Handling

- Avoid inhalation of gas or vapors.
- Ensure good ventilation in enclosed areas.
- Keep away from ignition sources.

7.2 Conditions for Safe Storage

- Store in a cool, dry, well-ventilated area away from direct sunlight.
- Keep containers upright and ensure they are properly labeled.

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8. Exposure Controls / Personal Protection

8.1 Control Parameters

Substance	Occupational Exposure Limits (OELs)
HFC-125	Not established
HFC-134a	1,000 ppm (TWA)
n-Butane	800 ppm (TWA)

8.2 Exposure Controls

Engineering Controls:

- Use local exhaust ventilation in confined areas.
- Ensure gas detection systems are in place.

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 direct skin contact.

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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	-40.6°C
Flash Point	-60°C
Vapor Pressure	10,200 kPa at 25°C
Vapor Density	3.4 (air = 1)
Solubility in Water	Slight
Partition Coefficient (Kow)	Not available
Auto-ignition Temperature	550°C
Decomposition Temperature	>400°C

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10. Stability and Reactivity

10.1 Reactivity

- Not reactive under normal conditions.

10.2 Chemical Stability

- Stable under recommended storage conditions.

10.3 Possibility of Hazardous Reactions

- No dangerous reactions are expected under normal use.

10.4 Conditions to Avoid

- Avoid heat, sparks, and open flames.

10.5 Incompatible Materials

- Strong oxidizers, alkali metals.

10.6 Hazardous Decomposition Products

- Thermal decomposition may produce 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:** Frostbite or cold burns may occur upon contact with liquid refrigerant.

Skin Corrosion/Irritation:

- Contact with liquid refrigerant may cause frostbite.

Serious Eye Damage/Irritation:

- Direct exposure to liquid refrigerant may cause severe eye damage or irritation.

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 or drowsiness due to inhalation of high concentrations of vapor.

12. Ecological Information

12.1 Toxicity

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

12.2 Persistence and Degradability

- The components of this product are persistent 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).

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.

14. Transport Information (Extended Chapter)

14.1 UN Number

- **UN 3161**

14.2 UN Proper Shipping Name

- **Liquefied Gas, Flammable, n.o.s. (contains R417A)**

14.3 Transport Hazard Class(es)

- **Class 2.1 (Flammable Gas)**

14.4 Packing Group

- Not applicable (gases do not have a packing group).

14.5 Environmental Hazards

- Not classified as a marine pollutant.

14.6 Special Precautions for User

- Ensure good ventilation during transport, particularly in confined spaces.
- Cylinders must be transported upright and properly secured.
- Ensure the cylinders are labeled with the UN number, hazard class, and the correct shipping name.

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

- Not applicable, as R417A is transported in cylinders and not in bulk.

14.8 Additional Transport Information

Transport by Road/Rail (ADR/RID):

- **Classification Code:** 2F (Flammable Gases)
- **Tunnel Restriction Code:** (B/D) – Prohibited in tunnels of category B when transported in bulk.

Transport by Sea (IMDG):

- **EMS Code:** F-D, S-U
- **Stowage:** Store away from heat sources and combustible materials. Ensure proper ventilation in storage and handling areas.

Transport by Air (IATA):

- **Packing Instruction:** 200
- **Passenger Aircraft:** Limited to smaller quantities.
- **Cargo Aircraft Only:** Larger quantities are allowed, but adequate ventilation and stowage are required.

Special Handling Instructions:

- Transport personnel must be trained in handling flammable gases.
- Inspect cylinders for leaks or damage before transport.
- Ensure proper labeling and cylinder integrity during transport.

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15. Regulatory Information

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

- **EU Regulations:**
  - **REACH Regulation (EC) No 1907/2006:** Registered components.
  - **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

Disclaimer:

- This information is believed to be accurate at the time of publication. It is provided for guidance on health, safety, and environmental aspects. It is the responsibility of the user to ensure compliance with local regulations.