

# SAFETY DATA SHEET

R-422B

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name** : R-422B  
**Other name** : 1,1,1,2,2-Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Isobutane  
**USE** : Refrigerant gas

**Manufacturers** : SRF Ltd. Chemicals Business  
VILL & PO: JHIWANA, Tehsil. TIJARA, Dist. - ALWAR,  
RAJASTHAN, INDIA  
Pin Code-301019

**EMERGENCY CONTACT:** (24 Hours/Day, 7 Days/Week)  
Mr. Manoj Kumar Sharma  
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## 2. HAZARDS IDENTIFICATION

### Classification:

Press. Gas H280: Contains gas under pressure; may explode if heated

### GHS label elements

The substance is classified and labeled according to the Globally Harmonized System (GHS).

**Hazard pictograms** :



GHS04

**Symbol** : Gas Cylinder

**Signal word** : Warning

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### Regd. Office:

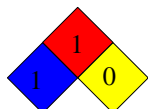
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**Hazard statements** : **H280:** Contains gas under pressure; may explode if heated.

**Precautionary statements** : **P410+P403:** Protect from sunlight. Store in a well-ventilated place.

**Classification system:**

**NFPA ratings (scale 0 - 4)**



Health = 1  
Fire = 1  
Reactivity = 0

**HMIS-ratings (scale 0 - 4)**



Health = 1  
Fire = 1  
Reactivity = 0

**Other Hazards:**

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Liquid contact with eyes or skin may cause frostbite.

**3. COMPOSITION, INFORMATION ON INGREDIENTS**

Substance name	concentrations (% w/w)	CAS No.	EC No	Classification Reg. (CE) 1272/2008 (CLP) and Directive 67/548/EEC
Pentafluoroethane (R125)	54% - 56%	354-33-6	206-557-8	Press. Gas (Liq.), H280
1,1,1,2-Tetrafluoroethane (R134a)	41% - 43%	811-97-2	212-337-0	Press. Gas (Liq.), H280
ISO Butane (R600a)	2.5% - 3.1%	75-28-5	200-857-2	Flam. Gas 1, H220 Press. Gas (Liq.), H280

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#### 4. FIRST AID MEASURES

- SKIN** : Warm the area gradually by flushing with plenty of water. Get medical attention if there is evidence of tissue damage
- EYES** : Irrigate eyes with running water for at least 15 minutes. Get medical attention. Get medical attention if symptoms persist.
- INHALATION** : Remove to fresh air. If not breathing, give artificial respiration administer oxygen and call a physician. DO NOT give epinephrine or similar drugs.
- INGESTION** : Do not induce vomiting. Get medical attention.

**ADVICE TO PHYSICIAN:** Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

#### 5. FIRE FIGHTING MEASURES

##### **Extinguishing Media**

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** None known.

##### **Special Hazards Arising From the Substance or Mixture;**

**Fire Hazard:** R422B is not flammable at atmospheric pressure.

**Explosion Hazard:** Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

##### **Advice for Firefighters:**

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products:** Carbon oxides (CO, CO<sub>2</sub>). Halogenated hydrocarbons. Hydrogen Fluoride (HF).

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## 6. ACCIDENTAL RELEASE MEASURES

### IN CASE OF SPILL OR OTHER RELEASE:

Note: Review FIRE FIGHTING MEASURES and HANDLING sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Remove or extinguish combustion sources. Evacuate enclosed spaces until gas is dispersed. Stop the release if possible. Ventilate area including low or enclosed spaces. Exhaust outdoors. Contain spill and collect remainder using absorbent material and place in drum approved for waste disposal or recovery.

Spills and releases may have to be reported to Federal and /or local authorities. See Section 15 regarding reporting requirements.

## 7. HANDLING AND STORAGE

### HANDLING (Personnel):

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Use with sufficient ventilation to keep employee exposure below recommended limits. Avoid contact with hot surfaces. Avoid high temperatures. Smoking is forbidden.

### STORAGE RECOMMENDATIONS:

Storage facilities should be equipped with ventilation at low level. Take all necessary precautions to avoid the accidental release of the product outside, due to the rupture of containers or transfer system. Keep the container tightly closed and dry in a cool, well-ventilated area. Keep at temperatures not exceeding 50 °C (122 °F) and away from any source of heat or ignition.

### INCOMPATIBLE MATERIALS:

Strong acids. Strong bases. Strong oxidizers. Chlorine.

### SPECIFIC END USE (S):

Refrigerant.

### FURTHER INFORMATION ON STORAGE STABILITY:

The product has an indefinite shelf life when stored properly.

Keep the container tightly closed and dry in a cool, well-ventilated area

Keep away from direct sunlight

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

### ENGINEERING CONTROLS:

Avoid contact with skin or eyes. Avoid breathing vapors. Use with sufficient ventilation to keep exposure below recommended exposure limit. Utilize mechanical ventilation in case of low or enclosed spaces, or release of large quantity.

### PERSONAL PROTECTIVE EQUIPMENT:

#### SKIN PROTECTION:

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

#### EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

#### RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

#### ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

#### EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV.	OSHA PEL	OTHER LIMITS
Pentafluoroethane (R125)	None	None	*1000 ppm TWA (8hr)
1,1,1,2-Tetrafluoroethane (R134a)	None	None	*1000 ppm TWA (8hr)
ISO Butane (R600a)	1000 ppm TWA (8hr)	None	** 800 ppm TWA (10hr)

\* = Workplace Environmental Exposure Level (AIHA).

\*\*= National Institute of Occupational Safety & Health (NIOSH).

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>APPEARANCE</b>	: Colorless
<b>PHYSICAL STATE</b>	: Gas at ambient temperatures
<b>MOLECULAR WEIGHT</b>	: 108.5
<b>CHEMICAL FORMULA</b>	: CF <sub>3</sub> CHF <sub>2</sub> , CF <sub>3</sub> CH <sub>2</sub> F, C <sub>4</sub> H <sub>10</sub>
<b>ODOR</b>	: Slight ethereal
<b>SPECIFIC GRAVITY (water = 1.0)</b>	: 1.17 @ 21°C
<b>SOLUBILITY IN WATER (weight %)</b>	: Not Determined
<b>pH</b>	: Neutral
<b>BOILING POINT</b>	: Dew @ 1 atm. -32.15°F Bubble @ 1 atm. -40.86 °F
<b>FREEZING POINT</b>	: Not Determined
<b>VAPOR PRESSURE</b>	: @ 68 deg. F 116.0 psia @ 140 deg. F 328.0 psia
<b>VAPOR DENSITY (air = 1.0)</b>	: 3.82
<b>EVAPORATION RATE</b>	: >1 (Compare to CC <sub>14</sub> = 1)
<b>% VOLATILES</b>	: 100
<b>FLASH POINT</b>	: Not applicable
<b>ODOR THRESHHOLD</b>	: Not established
<b>LEL/UEL</b>	: None/None
<b>RELATIVE DENSITY</b>	: 1.17 g/cm <sup>3</sup> @ 21°C
<b>PARTITION COEFF (n-octanol/ water)</b>	: Not applicable
<b>AUTO IGNITION TEMP</b>	: > 550°C (1022 °F)
<b>DECOMPOSITION TEMPERATURE</b>	: > 250°C
<b>VISCOSITY</b>	: Not applicable

## 10. STABILITY AND REACTIVITY

<b>Reactivity</b>	: Hazardous reactions will not occur under normal conditions.
<b>Chemical Stability</b>	: Stable under recommended handling and storage conditions (see section 7).
<b>Possibility of Hazardous Reactions Conditions to Avoid</b>	: Hazardous polymerization will not occur. : Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.
<b>Incompatible Materials</b>	: Strong acids. Strong bases. Strong oxidizers.
<b>Hazardous Decomposition Products</b>	: No Hazardous decompositions under normal conditions In case of fire, for thermal decomposition, the following substances can be released: halogen acids, carbon oxides (CO, CO <sub>2</sub> ), fluorocarbons and possible carbonyl halides.

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## 11. TOXICOLOGICAL INFORMATION

### IMMEDIATE (ACUTE) EFFECTS:

- R-125** : LC50: 4 hr. (rat) - > 800,000 ppm  
Cardiac Sensitization threshold (dog) 75,000 ppm.
- R-134a** : LC50: 4 hr. (rat) - > 500,000 ppm  
Cardiac Sensitization threshold (dog) 80,000 ppm.
- R-600a** : LC50: 15 min. (rat) - 570,000 ppm

### DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

- R-125** : Teratogenic NOEL (rat and rabbit) – 50,000 ppm  
Subchronic inhalation (rat) NOEL - >50,000 ppm  
Chronic NOEL – 10,000 ppm
- R-134a** : Teratogenic NOEL (rat and rabbit) – 40,000 ppm  
Subchronic inhalation (rat) NOEL - 50,000 ppm  
Chronic NOEL – 10,000 ppm
- R-600a** : Subchronic inhalation (rat) NOAEL - 4,489 ppm

### OTHER DATA:

- R-125, R-134a** : Not active in four genetic studies
- R-600a** : Negative Ames test with and without activation

### POTENTIAL HEALTH HAZARDS:

- SKIN** : Irritation can result from a defatting action on tissue. Liquid contact may cause frostbite
- EYE** : Liquid may cause frostbite. Mist may irritate.
- INHALATION** : Overexposure may cause dizziness and loss of concentration. At higher levels, central nervous system depression and cardiac arrhythmia may result.
- INGESTION** : Unlikely route of exposure. Should it result, discomfort in the gastrointestinal tract would occur.

**DELAYED EFFECTS:** None Known

**CHRONIC (CANCER) INFORMATION:** None of the components are designated as carcinogens by IARC, NTP, OSHA, or ACGIH.

**TERATOLOGY (BIRTH DEFECT) INFORMATION:** No hazard expected

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## 12. ECOLOGICAL INFORMATION

### DEGRADABILITY:

Refrigerant 422B is a gas at room temperature. It is unlikely to remain in water.

Octanol Water Partition Coefficient: As blended N/A (See section 9)

Components:	R-134a – Log Pow = 1.06	Aquatic Toxicity: R-134a
	R-125 – Log Pow = 1.48	48 hrs. LC50 – daphnia magna: mg/L
	R-600a – Log Pow = 2.8	96 hrs. LC50 rainbow trout: 450 mg/L

### Mobility in soil

NA

### Other Adverse Effects

In the air	: ODP (R-11=1)	= Zero (ozone depletion potential).
GWP (w.r.t. CO2 (time horizon 100 years))		= 2290 (greenhouse effect potential).

## 13. DISPOSAL CONSIDERATIONS

**RCRA:** Alteration to the product such as mixing with other material may change the characteristics of the material and alter the RCRA classification and the proper disposal method.

### OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local regulations. Refrigerant 422B is subject to Clean Air Act Regulations Section 608 in 40 CFR Part 82 concerning refrigerant recycling.

## 14. TRANSPORT INFORMATION

**UN NUMBER** : UN3163  
**PROPER SHIPPING NAME** : Liquefied Gas, N.O.S. (R422B)  
**HAZARD CLASS** : 2.2  
**PACKING GROUP** : N/A  
**HAZARD LABELS**  
**ADR/RID, IMDG, IATA/ ICAO** :



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## 15. REGULATORY INFORMATION

### TOXIC SUBSTANCE CONTROL ACT (TSCA)

Components: Listed on Inventory

### SARA TITLE III/CERCLA: Components:

Reportable Quantities (RQs)	: No components listed
Threshold Planning Quantities (TPQs)	: No components listed
Section 311 Hazard Class	: IMMEDIATE PRESSURE
Section 313 Toxic Chemical	: No components listed

### CALIFORNIA PROPOSITION 65:

The ingredients in this product do not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**WHMIS Classification (Canada):** This product has been evaluated with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**ADDITIONAL REGULATORY INFORMATION:** U. S. Clean Air Act – 40 CFR Part 82 CFR Part 82.

## 16. OTHER INFORMATION

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

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