

## Material Safety Data Sheet

### RS-24 (R426A)

#### 1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Name:	REACH Registration No:	CAS No:	EINECS No:
1,1,1,2 Tetrafluoroethane (HFC 134a)	01-2119459374-33	811-97-2	212-377-0
Pentafluoroethane (HFC125)	01-2119485636-25	354-33-6	206-557-8
Iso-Pentane (HC 601a)	01-2119475602-38	78-78-4	201-142-8
n-Butane (HC 600)	01-2119474691-32	106-97-8	203-448-7

#### 2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	%w/w	CAS No	EC No	Index number in CLP annex V1
1,1,1,2-tetrafluoroethane	93	811-97-2	212-377-0	Not Applicable
Pentafluoroethane	5.1	354-33-6	206-557-8	Not Applicable
n-Butane	1.3	106-97-8	203-448-7	601-004-00-0
Iso-Pentane	0.6	78-78-4	201-142-8	601-085-00-2

#### 3. HAZARDS IDENTIFICATION

Low acute toxicity. High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation. Liquid splashes or spray may cause freeze burns to skin and eyes.

EU Classification

Not classified as hazardous according to Directive EC 1272/2008

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Label Elements

Labelling according to Regulation (EC) 1272/2008 [CLP]



WARNING

Hazard Statement(s)

CLP H281 – Contains Refrigerated gases, may cause cryogenic burns or injury.

Precautionary Statement(s)

CLP P282 – Wear cold insulating gloves/ Face shield/ Eye protection

CLP P336 – Thaw frosted parts in lukewarm water. Do not rub affected area.

CLP P315 – Get immediate medical advice/attention.

CLP P403 – Store in a well ventilated place.

### 4. FIRST AID MEASURES

**Skin contact:** May cause frostbite. Wash frost-bitten area immediately with plenty of water. Do not remove clothing. Wash affected skin with warm water. If skin irritation persists, call a physician.

**Eye contact:** If substance has got into the eyes immediately wash out with plenty of water for at least 15 minutes. Keep eye wide open while rinsing.

**Ingestion:** Do not induce vomiting without medical advice.  
Call a physician immediately. Do not give drugs from adrenaline-ephedrine group.

**Inhalation:** Move to fresh air in case of accidental inhalation of vapours. Oxygen or artificial respiration if needed. Do not apply artificial respiration if patient is breathing. Consult a physician after significant exposure. Do not give adrenaline or similar drugs.

**General Advice:** Consult a physician for severe cases.

### 5. FIRE-FIGHTING MEASURES

**General:** This refrigerant is none flammable in air under ambient conditions of temperature and pressure. Certain mixtures of this refrigerant and air when under pressure may be

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flammable. Mixtures of this refrigerant and air under pressure should be avoided.

Certain mixtures of HFC's and Chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours (Hydrogen Fluoride). Containers may rupture violently if overheated.

**Extinguishing Media:** As appropriate for the surrounding fire. Keep containers exposed to fire cool, by spraying them with water.

**Protective Equipment:** A self-contained breathing apparatus and full protective clothing must be worn in fire conditions. See also section 8.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal Protection:** Ensure suitable personal protection (including respiratory protection) during removal of spillages.

**General:** Provided it is safe to do so, isolate the source of the leak. Allow small spillages to evaporate, provided there is adequate ventilation. For large spillages, ventilate the area. Contain the spillages with sand, soil or any suitable absorbent material. Prevent liquid from entering drains, sewers, basements and work pits, as the vapour may create a suffocating atmosphere.

### 7. HANDLING AND STORAGE

**Handling:** Avoid inhalation of high concentrations of vapours. Atmospheric levels should be controlled in compliance with the Occupational Exposure Limit. Atmospheric concentrations well below the Occupational Exposure Limit can be achieved by good occupational hygiene practice.

The vapour is heavier than air, high concentrations may be produced at low levels where generally ventilation is poor, in such cases provide additional ventilation or wear suitable positive air supply respiratory protective equipment.

Avoid contact with naked flames and hot surfaces as corrosive and very toxic decomposition products can be formed.

Avoid contact between the liquid, skin and eyes.

For correct refrigerant composition, systems should be charged using the liquid phase and not the vapour phase.

Avoid venting to atmosphere.

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The fluorinated greenhouse gas RS-24 (R426A) maybe supplied in returnable containers (cylinders or drums). The container contains fluorinated greenhouse gases covered by the Kyoto protocol. The fluorinated greenhouse gases in the containers may not be vented to atmosphere. Regulation (EC) No. 842/2006 of the European Parliament and the council on certain fluorinated greenhouse gases.

**Process Hazards:** Liquid refrigerant transfers between refrigerant containers and systems can result in static generation. Ensure adequate earthing. Certain mixtures of HFC's and Chlorine maybe flammable or reactive under certain conditions.

Care must be taken to mitigate the risk of developing high pressures in equipment caused by a temperature rise when liquid is trapped in a confined space, between two closed valves for instance.

**Storage:** Keep in a well ventilated place away from fire risk and avoid sources of heat such as electric or steam radiators.

Avoid storing near the intake of air conditioning units, boiler units and open drains.

**Specific Use:** Subject to Member State regulations, applicable uses are: refrigerant, blowing agent, propellant, solvent.

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering measures:** Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases.  
In cases of insufficient ventilation, where exposure to high concentrations of vapour is possible, suitable respiratory protective equipment, with a positive pressure air supply should be used.

**Hand Protection:** Wear gloves to EN511.

**Eye Protection:** Wear Eye protection to EN166.

Occupational Exposure Limits	CAS No	LTEL 8hr TWA ppm	LTEL 8hr TWA mg/m <sup>3</sup>	STEL (ppm) 15 min average	STEL mg/m <sup>3</sup> 15 min average	Source
1,1,1,2-tetrafluoroethane	811-97-2	1000	4240	-	-	GESTIS
Pentafluoroethane	354-33-6	500	2500	750	3750	GESTIS
n-Butane	106-97-8	800	1900	-	-	GESTIS
Iso-Pentane	78-78-4	1000	3000			GESTIS - EU

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquefied Gas
Colour:	Colourless
Odour:	Slight Ethereal
Solubility (water):	Insoluble
Solubility (other):	Soluble in: alcohols, chlorinated solvents, esters
Boiling Point:	-28.5°C
Vapour Pressure:	707 kPa at 25°C
Liquid Density:	1184 kg/m <sup>3</sup> at 25°C
Critical Temperature:	101°C
Critical Pressure:	4100 kPa
Flammability:	Non Flammable
Flash Point:	Not applicable
Auto-ignition Temperature:	Not determined

### 10. STABILITY AND REACTIVITY

Hazardous Reactions: Certain mixtures of HFC's and chlorine maybe flammable or reactive under certain conditions.

Incompatible materials: finely divided metals, magnesium and alloys containing more than 2% magnesium. Can react violently if in contact with alkali metals and alkaline earth metals – sodium, potassium and barium.

Hazardous Decomposition Products: Hydrogen Fluoride by thermal decomposition and hydrolysis.

### 11. TOXICOLOGICAL INFORMATION



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Inhalation	High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.								
Skin Contact	Liquid splashes and spray may cause freeze burns. Unlikely to be hazardous by skin absorption.								
Eye Contact	Liquid splashes and spray may cause freeze burns.								
Ingestion	Highly unlikely – but should this occur freeze burns will result.								
Long Term Exposure	<table> <tr> <td>HFC 134a:</td> <td>LC 50 inhalation (Rat)/4hrs: &gt; 350,000 ppm</td> </tr> <tr> <td>HFC 125:</td> <td>LC 50 inhalation (Rat)/4hrs: &gt; 769,000 ppm</td> </tr> <tr> <td>Butane</td> <td>LC 50 inhalation (Rat)/4hrs: &gt; 658 ppm</td> </tr> <tr> <td>Iso-Pentane</td> <td>LC 50 inhalation (Rat)/4hrs: &gt; 434,590 ppm</td> </tr> </table>	HFC 134a:	LC 50 inhalation (Rat)/4hrs: > 350,000 ppm	HFC 125:	LC 50 inhalation (Rat)/4hrs: > 769,000 ppm	Butane	LC 50 inhalation (Rat)/4hrs: > 658 ppm	Iso-Pentane	LC 50 inhalation (Rat)/4hrs: > 434,590 ppm
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### 12. ECOLOGICAL INFORMATION

Environmental fate and distribution:	High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Vapour. No data available.
Persistence and Degradation:	<p>HFC 125: Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 29 years.</p> <p>HFC 134a: Decomposed comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 14 years.</p> <p>Iso-Pentane: Has an atmospheric lifetime of approximately 10 years.</p> <p>Butane: Has an atmospheric lifetime of approximately 10 years.</p> <p>RS-24 (R426A): Does not influence photochemical smog (i.e. is not a VOC under the terms of the UNECE agreement). Does not deplete Ozone. Has a Global Warming Potential (GWP) of 1382 (relative to 1 of carbon dioxide at 100 years) according to Annex 1 of regulation 842/2006 on certain fluorinated greenhouse gases. Values in Annex 1 are taken from the third assessment report (TAR) of the Intergovernmental Panel on Climate Change (2001 IPCC GWP values). United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 1352.</p>
Effect on Effluent Treatment:	Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.
PBT and vPvB:	This mixture does not contain any substances that are assessed to be a PBT or a vPvB..

### 13. DISPOSAL CONSIDERATIONS

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**Recommended:** It is best to recover and recycle, Refrigerant Solutions Limited will take back product for reclamation provided RS-24 has not been mixed with other products. If this is not possible, destruction is to be in an approved facility which is equipped to absorb and neutralise acidic gases and other toxic processing products.

### 14. TRANSPORT INFORMATION

UN Number: 1078  
UN proper shipping name: Refrigerant Gas R426A (RS-24).  
Transport Hazard Class(es): 2.2  
Packing Group: 2  
Environmental Hazards: The container contains fluorinated greenhouse gases covered by the Kyoto Protocol and may not be vented to atmosphere.  
Special Precautions for User: Liquid splashes or spray may cause freeze burns to skin and eyes.  
Transport in Bulk: It is not intended that this product will be transported in bulk according to Annex II of MARPOL73/78.

### 15. REGULATORY INFORMATION

European Regulations: Not classified as hazardous according to Directive EC 1272/2008

Special restrictions: The fluorinated greenhouse gas RS-24 (R426A) may be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases covered by the Kyoto Protocol. The fluorinated greenhouse gases in containers may not be vented to atmosphere.

Regulation (EC) No. 842/2006 of the European Parliament and the Council on certain fluorinated gases.

Directive 2006/40/EC of the European Parliament and the Council relating to emissions from the air-conditioning systems in motor vehicle vehicles and amending Council Directive 70/156/EEC.

R-phrases: No R-phrases

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S-phrase(s): S7/9 – Keep container tightly closed in a well-ventilated place  
S24/25 – Avoid contact with skin and eyes  
S47 – Keep at temperature not exceeding 50°C  
S51 – Use only in well ventilated areas  
S61 – Avoid release to the environment.

### 16. ADDITIONAL INFORMATION

Additional information: This safety data sheet complies with the 28th adaption of E.C. directive 67/548/EEC, known in the U.K. as CHIP 3. Emergency Telephone - 07967-745174

Risk phrases used in s.2: R8: Contact with combustible material may cause fire.  
R22: Harmful if swallowed.  
R31: Contact with acids liberates toxic gas.  
R34: Causes burns.  
R50: Very toxic to aquatic organisms.  
R36: Irritating to eyes.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Modifications to Revision 2 SDS Modifications to comply with CPL regulations for June 2015

#### Glossary

GESTIS: GESTIS International Limit values Database  
PBT Persistent, Bioaccumulative and Toxic substance  
vPvT Very Persistent and Very Bioaccumulative  
REACH Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006  
LC50 Lethal Concentration to 50 % of a test population  
CLP Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008





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## Material Safety Data Sheet

EU	European Union
CAS#	Chemical Abstracts Service number
LTEL	Long Term Exposure Limit
STEL	Short Term Exposure Limit

The information provided in this Product Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.