

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

| | |
|------------------------------|---|
| Product name | R407A |
| EU REACH registration number | See section 3: Composition/information on ingredients |
| CAS No. | See section 3: Composition/information on ingredients |
| EC No. | See section 3: Composition/information on ingredients |

1.2 Relevant identified uses of the substance or mixture and uses advised against

| | |
|----------------|---|
| Product use | Refrigerant Industrial uses: Uses of substances as such or in preparations at industrial sites Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| Restricted use | Consumer uses: Private households (= general public = consumers) |
| Description | Gas |

1.3 Details of the supplier of the safety data sheet

| | |
|---------------------------|---|
| Company | Star International Limited |
| Address | Star International Star House Turbine Business Park Birkenhead Merseyside CH41 9BA UK |
| Web | www.star-international.co.uk |
| Telephone | +44 (0) 1244 504 500 |
| Fax | +44 (0) 1244 504 500 |
| Email | enquiries@star-international.co.uk |
| Email of competent person | enquiries@star-international.co.uk |

1.4 Emergency telephone number


| | |
|----------------------------|----------------------|
| Emergency telephone number | +44 (0) 1244 504 500 |
|----------------------------|----------------------|

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

| | |
|-------------------------------|----------------------|
| Classification – EC 1272/2008 | Compressed gas: H280 |
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2.2 Label elements

| | |
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| Hazard pictograms |  |
| Signal word | Warning |
| Hazard statement | H280 – Contains gas under pressure; may explode if heated |
| Precautionary statement | P410+P403 – Protect from sunlight. Store in a well-ventilated place. |

2.3 Other hazards

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| Other hazards | Asphyxiant in high concentrations. May cause cold burns/frostbite. |
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SECTION 3: Composition/information on ingredients

3.1 Substances

EC 1272/2008

| Chemical name | CAS No. | EC No. | EU REACH registration number | Concentration (%w/w) | Classification |
|-----------------------------------|----------|-----------|------------------------------|----------------------|---|
| 1,1,1,2-Tetrafluoroethane (R134a) | 811-97-2 | 212-377-0 | 01-2119459374-33 | ca. 40 | Compressed gas: H280 |
| Pentafluoroethane (R125) | 354-33-6 | 206-557-8 | 01-2119485636-25 | ca. 40 | Compressed gas: H280 |
| Difluoromethane (R32) | 75-10-5 | 200-839-4 | 01-2119471312-47 | ca. 20 | Flam. Gas 1: H220 Compressed gas: H280 |

SECTION 4: First aid measures

4.1 Description of first aid measures

| | |
|--------------|---|
| Inhalation | Move the exposed person to fresh air |
| Eye contact | Rinse immediately with plenty of water |
| Skin contact | Frostbite: treat as thermal burns |
| Ingestion | Ingestion is not considered a potential route of exposure |

4.2 Most important symptoms and effects, both acute and delayed

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|--------------|---|
| Inhalation | Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Respiratory arrest. |
| Eye contact | Contact with liquefied gas can cause damage due to evaporative cooling |
| Skin contact | Contact with liquefied gas can cause damage due to evaporative cooling |
| Ingestion | Ingestion is not considered a potential route of exposure |

4.3 Indication of any immediate medical attention and special treatment needed

| | |
|--------------|---|
| Inhalation | If you feel unwell, seek medical advice |
| Eye contact | Seek medical attention if irritation or symptoms persist |
| Skin contact | Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention. |
| Ingestion | Ingestion is not considered a potential route of exposure |

SECTION 5: Firefighting measures

5.1 Extinguishing media

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| | This product is not flammable in air under ambient conditions of temperature and pressure. Use extinguishing media appropriate to the surrounding fire conditions. |
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5.2 Special hazards arising from the substance or mixture

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| | At high temperature, toxic and/or corrosive fumes may be produced by thermal decomposition (gaseous hydrogen fluoride (HF), carbon oxides). |
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5.3 Advice for firefighters

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| | Wear self-contained breathing apparatus and protective clothing. Heat may cause the containers to explode. Keep fire exposed containers cool by spraying with water. Fire exposed containers may vent contents through pressure relief devices. In case of fire nearby, remove exposed containers. |
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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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| | Ensure adequate ventilation of the working area. Avoid contact with skin and eyes. Evacuate personnel to a safe area. Wear self-contained breathing apparatus and protective clothing. Vapours are heavier than air. Prevent from entering sewers, basements or workpits. Do not enter confined spaces where gas may have accumulated. |
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6.2 Environmental precautions

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| | Prevent further leakage or spillage if safe to do so. |
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6.3 Methods and material for containment and clean up

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| | Allow to evaporate. Provide adequate ventilation. |
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6.4 Reference to other sections

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| | See section 8 Exposure controls / personal protection See section 13 Disposal considerations |
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SECTION 7: Handling and storage

7.1 Precautions for safe handling

| | |
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| | Only experienced and properly instructed persons should handle gases under pressure. Protect containers from physical damage. Do not drag, roll, slide or drop. Do not remove or deface labels. Adopt best manual handling considerations when handling, carrying and dispensing. Secure cylinders in an upright position at all times. Close valves when not in use and when empty. Ensure adequate ventilation of the working area. Do not allow backfeed into the container. Avoid contact with skin and eyes. When using, do not eat, drink or smoke. Never use direct flame or electrical heating device to raise the pressure of the container. |
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7.2 Conditions for safe storage, including any incompatibilities

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| | Keep containers tightly closed. Keep in a cool, dry, well-ventilated area. Store in correctly labelled containers. Keep away from sources of ignition – no smoking. Store out of direct sunlight. |
| Suitable packaging | Stainless steel, steel. |

7.3 Specific end use(s)

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| | See section 1.2 Relevant identified uses of the substance or mixture and uses advised against for further information. |
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SECTION 8: Exposure controls/personal protection

8.1 Control parameters – exposure limit values

| Component | CAS No. | Value type (form of exposure) | Exposure limit values | Source |
|---------------------------|----------|----------------------------------|---------------------------------|--------|
| 1,1,1,2-Tetrafluoroethane | 811-97-2 | TWA | 1000ppm / 4240mg/m ³ | EH40 |
| Pentafluoroethane | 354-33-6 | | Not listed in EH40 | |
| Difluoromethane | 75-10-5 | | Not listed in EH40 | |

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|----------------------------------|---|
| Appropriate engineering controls | Ensure adequate ventilation of the working area. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leaks. |
| Individual protection measures | Wear protective clothing |
| Eye/face protection | Approved safety goggles |
| Skin & body protection | Wear suitable gloves. Wear safety shoes when handling containers. |
| Respiratory protection | Wear suitable respiratory protection equipment when necessary |
| Occupational exposure controls | Keep away from food, drink and animal feedstuffs. |
| Hygiene protection | Good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product. |

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

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| Appearance - Physical state | Gas |
| Appearance - Form | Liquefied gas |
| Colour | Colourless |
| Odour | Slight ethereal |
| Odour threshold | No data available |
| pH | Not applicable |
| Melting point | No data available |
| Boiling point / range | -45°C |
| Flash point | Not applicable |
| Evaporation rate | Not applicable |
| Flammability (solid, gas) | This product is not flammable |
| Upper explosion limit / Lower flammability limit | Not applicable |
| Vapour pressure | 1,253.1 kPa (25°C) |
| Vapour density | 3.17 (air = 1) |
| Relative density | 1.15 (25°C) |
| Solubility(ies) | |
| Water solubility | No data available |
| Partition coefficient: n-octanol/water | No data available |
| Auto-ignition temperature | Not applicable |
| Decomposition temperature | No data available |
| Viscosity | |
| Viscosity, kinematic | No data available |
| Explosive properties | Not applicable |
| Oxidising properties | Not applicable |

SECTION 10: Stability and reactivity

10.1 Reactivity

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| | Stable under normal conditions |
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10.2 Chemical stability

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| | Stable under normal conditions. The gaseous product in the presence of air can form, under certain conditions of temperature and pressure, a flammable mixture. |
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| | No data is available on this product |
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10.4 Conditions to avoid

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| | Keep away from heat and sources of ignition. Avoid contact with flames and red hot metallic surfaces. |
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10.5 Incompatible materials

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| | Alkaline hydroxides, alkaline earth metals, strong oxidizing agents, finely divided metals. |
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10.6 Hazardous decomposition products

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| | Under normal conditions of storage and use, hazardous decomposition products should not be produced. At high temperature, thermal decomposition can give rise to toxic and corrosive products. |
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SECTION 11: Toxicological information

11.1 Information on toxicological effects

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| Acute toxicity | As with other volatile aliphatic halogenated compounds, through vapour accumulation and/or inhalation of large quantities, the product can cause loss of consciousness and cardiac disorders aggravated by stress and lack of oxygen. Risk of mortality. |
| Skin corrosion/irritation | Ejection of liquefied gas: frostbite possible |
| Serious eye damage/irritation | Ejection of liquefied gas: frostbite possible |
| Respiratory or skin sensitisation | No data available |
| Germ cell mutagenicity | No data available |
| Carcinogenicity | No data available |
| Reproductive toxicity | No data available |
| STOT single exposure | No data available |
| STOT repeated exposure | No data available |
| Aspiration hazard | No data available |
| Repeated or prolonged exposure | No data available |

SECTION 12: Ecological information

12.1 Toxicity

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|--|-------------------|
| | No data available |
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12.2 Persistence and degradability

| | |
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| | Not applicable to gases and gas mixtures |
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12.3 Bioaccumulative potential

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| | Expected to biodegrade and not expected to persist for long periods in an aquatic environment |
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12.4 Mobility in soil

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| | Unlikely to cause ground or water pollution due to its high volatility |
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12.5 Results of PBT and vPvB assessment

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|--|-------------------------------|
| | Not classified as PBT or vPvB |
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12.6 Other adverse effects

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| | Contains fluorinated greenhouse gases. When discharged in large quantities may contribute to the greenhouse effect. Global warming potential: 2107 |
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R407A


SECTION 13: Disposal considerations

13.1 Waste treatment methods

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| | Dispose of in accordance with all local and national regulations. Avoid discharges to atmosphere. Refer to manufacturer/supplier for information on recovery/recycling. Dispose of container via supplier only. EWC code: 14 06 01* Chlorofluorocarbons, HCFC, HFC |
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SECTION 14: Transport information

Hazard pictograms

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14.1 UN number

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| | UN 3338 |
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14.2 UN proper shipping name

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| | REFRIGERANT GAS R407A |
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14.3 Transport hazard class(es)

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|-----------------------|----------|
| ADR/RID | |
| Class | 2 |
| Labels | 2.2 |
| Hazard No. (ADR) | 20 |
| Tunnel category | (C/E) |
| Emergency action code | 2TE |
| IMDG | |
| Class | 2.2 |
| EmS No. | F-C, S-V |
| IATA | |
| Class | 2.2 |
| Packing instruction | 200 |

14.4 Packing group

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| | - |
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14.5 Environmental hazards

| | |
|-----------------------|--------------------------------------|
| Environmental hazards | Not applicable |
| Marine pollutant | Not classified as a marine pollutant |

14.6 Special precautions for user

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| | Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure container valves are closed, not leaking and caps in place. Ensure containers are firmly secured. Ensure adequate air ventilation. |
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14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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| | Not applicable |
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SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

| | |
|--------------------|---|
| Regulations | REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. |
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15.2 Chemical safety assessment

| | |
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| | A CSA has not been carried out |
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SECTION 16: Other information

Other information

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| Text of Hazard Statements in Section 3 | H280: Contains gas under pressure; may explode if heated. H220: Extremely flammable gas |
| Reference materials | HSE publication EH40/2005 Workplace exposure limits (latest edition) |
| Changes from previous versions | Change to heading, section 1.1 and 15.2. |

Further information

| | |
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| | The information supplied in this safety data sheet is designed only as guidance for the safe use, storage and handling of the product. This information is correct to the best of our knowledge and belief at the date of publication however no guarantee is made of its accuracy. This 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 other process. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the material in the user's end product, if applicable. |
|--|---|