SAFETY DATA SHEET

C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

Issue date: 07.10.2014  
Revision date: 09.10.2014  
Version: 1.0  
SDS No.: 000010022565

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

1.1 Product identifier

Product name: C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

Trade name: RS-70

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


Uses advised against: Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier: BOC  
Telephone: 0800 111 333

E-Mail: ReachSDS@boc.com

1.4 Emergency telephone number: 0800 111 333

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

Not classified

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards

Gases under pressure
Liquefied gas

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

2.2 Label elements

Signal words: Warning

Hazard Statement(s): H280: Contains gas under pressure; may explode if heated.
SAFETY DATA SHEET

C4H10 0,6 %;C5H12 0,6 %;C3HF7 5 %;C2HF5 20 %;CH2F2 20 %;CH2FCF3 53,8 %

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Precautionary statement

Prevention: None.
Response: None.
Storage: P403: Store in a well-ventilated place.
Disposal: None.

Supplemental label information
EIGA-0783: Contains fluorinated greenhouse gases covered by the Kyoto protocol.
EIGA-As: Asphyxiant in high concentrations.

2.3 Other hazards:
Contact with evaporating liquid may cause frostbite or freezing of skin.

SECTION 3: Composition/ information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Chemical formula</th>
<th>Concentration</th>
<th>CAS-No.</th>
<th>EC No.</th>
<th>REACH Registration No.</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>C4H10</td>
<td>0,6000 (%)</td>
<td>106-97-8</td>
<td>203-448-7</td>
<td>01-2119474691-32</td>
<td>#</td>
</tr>
<tr>
<td>Pentafluoroethane</td>
<td>C2HF5</td>
<td>20 (%)</td>
<td>354-33-6</td>
<td>206-557-8</td>
<td>01-2119485636-25</td>
<td></td>
</tr>
<tr>
<td>1,1,1,2,3,3,3-Heptafluoropropane</td>
<td>C3HF7</td>
<td>5 (%)</td>
<td>431-89-0</td>
<td>207-079-2</td>
<td>01-2119485489-18</td>
<td></td>
</tr>
<tr>
<td>Difluoromethane</td>
<td>CH2F2</td>
<td>20 (%)</td>
<td>75-10-5</td>
<td>200-839-4</td>
<td>01-2119471312-47</td>
<td></td>
</tr>
<tr>
<td>Isopentane; 2-methylbutane</td>
<td>C5H12</td>
<td>0,6000 (%)</td>
<td>78-78-4</td>
<td>201-142-8</td>
<td>01-2119475602-38</td>
<td>#</td>
</tr>
<tr>
<td>Norflurane</td>
<td>C2H2F4</td>
<td>53,8000 (%)</td>
<td>811-97-2</td>
<td>212-377-0</td>
<td>01-2119459374-33</td>
<td>#</td>
</tr>
</tbody>
</table>

All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in mol percent. All concentrations are nominal.
# This substance has workplace exposure limit(s).
PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.
### Classification

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Classification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>DSD: F+; R12</td>
<td>Flam. Gas 1; H220, Press. Gas Liquef. Gas; H280</td>
</tr>
<tr>
<td>Pentafluoroethane</td>
<td>DSD: None</td>
<td>Press. Gas Liquef. Gas; H280</td>
</tr>
<tr>
<td>1,1,2,3,3,3-Heptafluoropropane</td>
<td>DSD: None</td>
<td>Press. Gas Liquef. Gas; H280</td>
</tr>
<tr>
<td>Difluoromethane</td>
<td>DSD: F+; R12</td>
<td>Flam. Gas 1; H220, Press. Gas Liquef. Gas; H280</td>
</tr>
<tr>
<td>isopentane; 2-methylbutane</td>
<td>DSD: F+; R12 Xn; R65 R66 R67 N; R51/53</td>
<td>Flam. Liq. 1; H224, Asp. Tox. 1; H304, STOT SE 3; H336, Aquatic Chronic 2; H411</td>
</tr>
<tr>
<td>Norflurane</td>
<td>DSD: None</td>
<td>Press. Gas Liquef. Gas; H280</td>
</tr>
</tbody>
</table>

DSD: Directive 67/548/EEC.  

The full text for all R- and H-phrases is displayed in section 16.

### SECTION 4: First Aid Measures

**General:** In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

**4.1 Description of first aid measures**

**Inhalation:** In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

**Eye contact:** Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.

**Skin contact:** Contact with evaporating liquid may cause frostbite or freezing of skin.

**Ingestion:** Ingestion is not considered a potential route of exposure.

**4.2 Most important symptoms and effects, both acute and delayed:** Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Symptoms may include: Anaesthetic effects. Dizziness. Irregular cardiac activity. Unconsciousness. Loss of co-ordination.
4.3 Indication of any immediate medical attention and special treatment needed

Hazards: Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Treatment: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention. Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

SECTION 5: Firefighting Measures

General fire hazards: Heat may cause the containers to explode.

5.1 Extinguishing media

Suitable extinguishing media: Material will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: None.

5.2 Special hazards arising from the substance or mixture:

Fire or excessive heat may produce hazardous decomposition products. The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.

Hazardous Combustion Products: If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Carbon oxides fluorocarbons Hydrogen fluoride

5.3 Advice for firefighters

Special fire fighting procedures: In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

Special protective equipment for firefighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire fighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.
SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:
Evacuate area. Provide adequate ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

6.2 Environmental precautions:
Prevent further leakage or spillage if safe to do so.

6.3 Methods and material for containment and cleaning up:
Provide adequate ventilation.

6.4 Reference to other sections:
Refer to sections 8 and 13.

SECTION 7: Handling and Storage:

7.1 Precautions for safe handling:
Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/ regional/ national/ international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place.
SAFETY DATA SHEET

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7.2 Conditions for safe storage, including any incompatibilities: Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

7.3 Specific end use(s): None.

SECTION 8: Exposure Controls/ Personal Protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Type</th>
<th>Exposure Limit Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norflurane</td>
<td>TWA</td>
<td>1.000 ppm 4.240 mg/m³</td>
<td>UK. EH40 Workplace Exposure Limits (WELs) (12 2011)</td>
</tr>
<tr>
<td>Butane</td>
<td>TWA</td>
<td>600 ppm 1.450 mg/m³</td>
<td>UK. EH40 Workplace Exposure Limits (WELs) (12 2011)</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>750 ppm 1.810 mg/m³</td>
<td>UK. EH40 Workplace Exposure Limits (WELs) (12 2011)</td>
</tr>
<tr>
<td>isopentane; 2- methylbutane</td>
<td>TWA</td>
<td>600 ppm 1.800 mg/m³</td>
<td>UK. EH40 Workplace Exposure Limits (WELs) (12 2011)</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>1.000 ppm 3.000 mg/m³</td>
<td>EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)</td>
</tr>
</tbody>
</table>

DNEL-Values

<table>
<thead>
<tr>
<th>Critical component</th>
<th>Type</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentfluoroethane</td>
<td>Worker - inhalative, long-term - systemic</td>
<td>16444 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>1,1,1,2,3,3,3-Heptafluoropropane</td>
<td>Worker - inhalative, long-term - systemic</td>
<td>61279 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Difluoromethane</td>
<td>Worker - inhalative, long-term - systemic</td>
<td>7035 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>isopentane; 2-methylbutane</td>
<td>Worker - inhalative, long-term - systemic</td>
<td>3000 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Worker - dermal, long-term - systemic</td>
<td>432 mg/kg bw/day</td>
<td>-</td>
</tr>
<tr>
<td>Norflurane</td>
<td>Worker - inhalative, long-term - systemic</td>
<td>13936 mg/m³</td>
<td>-</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET
C4H10 0,6 %;C5H12 0,6 %;C3HF7 5 %;C2HF5 20 %;CH2F2 20 %;CH2FCF3 53,8 %

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8.2 Exposure controls

Appropriate engineering controls:
Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Preferably use permanent leak tight connections (eg. welded pipes). Do not eat, drink or smoke when using the product.

Individual protection measures, such as personal protective equipment

General information:
A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Eye/face protection:
Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.

Skin protection

Hand protection:
Wear working gloves while handling containers
Guideline: EN 388 Protective gloves against mechanical risks.

Body protection:
No special precautions.
SAFETY DATA SHEET

C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

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Other: Wear safety shoes while handling containers

Guideline: ISO 20345 Personal protective equipment - Safety footwear.

Respiratory Protection: Not required.

Thermal hazards: No precautionary measures are necessary.

Hygiene measures: Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.

Environmental exposure controls: For waste disposal, see section 13.

SECTION 9: Physical And Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state:</td>
<td>Gas</td>
</tr>
<tr>
<td>Form:</td>
<td>Liquefied gas</td>
</tr>
<tr>
<td>Colour:</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour:</td>
<td>Odourless</td>
</tr>
<tr>
<td>Odour Threshold:</td>
<td>Odour threshold is subjective and is inadequate to warn of over exposure.</td>
</tr>
<tr>
<td>pH:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting Point:</td>
<td>No data available.</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>-42.2 °C</td>
</tr>
<tr>
<td>Sublimation Point:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Critical Temp. (°C):</td>
<td>87.9 °C</td>
</tr>
<tr>
<td>Flash Point:</td>
<td>Not applicable to gases and gas mixtures.</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>Not applicable to gases and gas mixtures.</td>
</tr>
<tr>
<td>Flammability (solid, gas):</td>
<td>Non-Flammable Gas</td>
</tr>
<tr>
<td>Flammability limit - upper (%) -:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability limit - lower(%) -:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapour pressure:</td>
<td>11.22 bar (25 °C)</td>
</tr>
<tr>
<td>Vapour density (air=1):</td>
<td>3.47 (Calculated)</td>
</tr>
<tr>
<td>Relative density:</td>
<td>No data available.</td>
</tr>
</tbody>
</table>

Solubility(ies)

| Solubility in Water:         | Insoluble in water        |
| Partition coefficient (n-octanol/ water): | Not known. |
| Autoignition Temperature:    | Not applicable.           |
| Decomposition Temperature:   | Not known.                |
| Viscosity                    |                           |
| Kinematic viscosity:         | No data available.        |
| Dynamic Viscosity:           | No data available.        |
### SAFETY DATA SHEET

**C4H10 0.6 %; C5H12 0.6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53.8 %**

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explosive properties:</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Oxidising Properties:</strong></td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

#### 9.2 Other information:
Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

### SECTION 10: Stability and Reactivity

**10.1 Reactivity:**
No reactivity hazard other than the effects described in sub-section below.

**10.2 Chemical stability:**
Stable under normal conditions.

**10.3 Possibility of hazardous reactions:**
None.

**10.4 Conditions to avoid:**
Avoid heat, sparks, flame and high pressure. The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.

**10.5 Incompatible materials:**
Strong bases Alkalis, alkaline earth metals (e.g., powdered aluminium, sodium, potassium, zinc)

**10.6 Hazardous decomposition products:**
Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Carbon oxides fluorocarbons Hydrogen fluoride ; Carbonyl difluoride

### SECTION 11: Toxicological Information

**11.1 Information on toxicological effects**

**Acute Toxicity - Oral Product**
Based on available data, the classification criteria are not met.

**Component information**

<table>
<thead>
<tr>
<th>Component</th>
<th>LD 50 (Rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>isopentane; 2-methylbutane</td>
<td>&gt;2000 mg/kg</td>
</tr>
</tbody>
</table>

**Acute Toxicity - Dermal Product**
Based on available data, the classification criteria are not met.

**Acute Toxicity - Inhalation Product**
Not classified for acute toxicity based on available data.
SAFETY DATA SHEET

C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

Component information

Butane

LC50 (Rat, 4 h): 658 mg/l

Pentafluoroethane

LC0 (Rat, 4 h): > 800000 ppm

Difluoromethane

LC0 (Rat, 4 h): > 520000 ppm

isopentane; 2-methylbutane

LC50 (Rat, 4 h): > 25,3 mg/l

Repeated dose toxicity

Component information

Pentafluoroethane

NOEC (Rabbit (Male)): 500 ppm
NOEC (Rabbit (Female)): 1000 ppm

Skin corrosion/irritation

Product

Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Product

Based on available data, the classification criteria are not met.

Component information

Butane

Not irritating

Respiratory or skin sensitisation

Product

Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product

Based on available data, the classification criteria are not met.

Carcinogenicity

Product

Based on available data, the classification criteria are not met.

Reproductive toxicity

Product

Based on available data, the classification criteria are not met.

Specific target organ toxicity - single exposure

Product

Based on available data, the classification criteria are not met.

Specific target organ toxicity - repeated exposure

Product

Based on available data, the classification criteria are not met.

Aspiration hazard

Product

Not applicable to gases and gas mixtures.

Other Relevant Toxicity Information

SDS GB - 000010022565
SAFETY DATA SHEET
C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

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Component information
Pentafluoroethane  No Observed Adverse Effect Concentration / Dog: 100000 ppm
Cardiac sensitization
Low Observed Adverse Effect Concentration (LOAEC) / Dog: 75000 ppm
Cardiac sensitization

Difluoromethane  Low Observed Adverse Effect Concentration (LOAEC) / Dog: >350000 ppm
Cardiac sensitization
No Observed Adverse Effect Concentration / Dog: 350000 ppm
Cardiac sensitization

SECTION 12: Ecological Information

12.1 Toxicity

Acute toxicity
Product  No ecological damage caused by this product.

Acute toxicity - Fish
Component information
Pentafluoroethane  LC50 (Rainbow trout (Oncorhynchus mykiss), 96 h): 450 mg/l

Difluoromethane  LC50 (Fish, 96 h): 1507 mg/l

isopentane; 2-methylbutane  LC50 (Rainbow trout (Oncorhynchus mykiss), 96 h): 426 mg/l

Norflurane  LC50 (Fish, 96 h): 450 mg/l

Acute toxicity - Aquatic invertebrates
Component information
Pentafluoroethane  EC50 (48 h): >200 mg/l

Difluoromethane  EC50 (Water flea (Daphnia), 48 h): 652 mg/l

isopentane; 2-methylbutane  EC50 (Water flea (Daphnia magna)): 23 mg/l

Norflurane  EC50 (Water flea (Daphnia magna), 48 h): 930 mg/l

Toxicity to aquatic plants
Component information
Pentafluoroethane  EC50 (Green algae, 96 h): 142 mg/l

Difluoromethane  EC50 (Alga, 96 h): 142 mg/l

isopentane; 2-methylbutane  NOEC (Algae (Pseudokirchneriella subcapitata), 72 h): 751 mg/l
EC50 (Algae (Pseudokirchneriella subcapitata), 72 h): 107 mg/l

SDS_GB - 000010022565
SAFETY DATA SHEET

C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

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12.2 Persistence and degradability
Product
Not applicable to gases and gas mixtures.

12.3 Bioaccumulative potential
Product
The product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.

12.4 Mobility in soil
Product
Because of its high volatility, the product is unlikely to cause ground or water pollution.

Component information
isopentane; 2-methylbutane
Henry's Law Constant: Estimated 7.851 MPa

Norflurane
Henry's Law Constant: Estimated 8.580 MPa (25 °C)

12.5 Results of PBT and vPvB assessment
Product
Not classified as PBT or vPvB.

12.6 Other adverse effects:
Global Warming Potential
Global warming potential: 1765
Contains fluorinated greenhouse gases covered by the Kyoto protocol. When discharged in large quantities may contribute to the greenhouse effect. For GWP value of mixture and quantities, refer to container label.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods
General information:
Do not discharge into any place where its accumulation could be dangerous. Vent to atmosphere in a well ventilated place.

Disposal methods:
Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.

European Waste Codes
Container: 14 06 01: chlorofluorocarbons, HCFC, HFC
SECTION 14: Transport Information

ADR
14.1 UN number: UN 3163
14.2 UN proper shipping name: LIQUEFIED GAS, N.O.S. (1,1,1,2-Tetrafluoroethane, Difluoromethane)
14.3 Transport hazard class(es)
   Class: 2
   Label(s): 2.2
   Hazard No. (ADR): 20
   Tunnel restriction code: (C/ E)
   Emergency Action Code: 2TE
14.4 Packing group: -
14.5 Environmental hazards: Not applicable
14.6 Special precautions for user: -

RID
14.1 UN number: UN 3163
14.2 UN proper shipping name: LIQUEFIED GAS, N.O.S. (1,1,1,2-Tetrafluoroethane, Difluoromethane)
14.3 Transport hazard class(es)
   Class: 2
   Label(s): 2.2
14.4 Packing group: -
14.5 Environmental hazards: Not applicable
14.6 Special precautions for user: -

IMDG
14.1 UN number: UN 3163
14.2 UN proper shipping name: LIQUEFIED GAS, N.O.S. (1,1,1,2-Tetrafluoroethane, Difluoromethane)
14.3 Transport hazard class(es)
   Class: 2.2
   Label(s): 2.2
   EmS No.: F-C, S-V
14.3 Packing group: -
14.5 Environmental hazards: Not applicable
14.6 Special precautions for user: -

IATA
14.1 UN number: UN 3163
14.2 Proper Shipping Name: Liquefied gas, n.o.s. (1,1,1,2-Tetrafluoroethane, Difluoromethane)
14.3 Transport hazard class(es):
   Class: 2.2
   Label(s): 2.2
14.4 Packing group: -
14.5 Environmental hazards: Not applicable
14.6 Special precautions for user: -
   Other information
   Passenger and cargo aircraft: Allowed.
   Cargo aircraft only: Allowed.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable
SECTION 15: Regulatory information

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

EU Regulations

Regulation (EC) No. 1907/2006 Annex XVII Substances subject to restriction on marketing and use:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>106-97-8</td>
<td>0,1 - 1,0 %</td>
</tr>
<tr>
<td>isopentane; 2-methylbutane</td>
<td>78-78-4</td>
<td>0,1 - 1,0 %</td>
</tr>
</tbody>
</table>

Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens and mutagens at work:

<table>
<thead>
<tr>
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<th>Concentration</th>
</tr>
</thead>
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<td>78-78-4</td>
<td>0,1 - 1,0 %</td>
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</tbody>
</table>

Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breast feeding:

<table>
<thead>
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<th>Concentration</th>
</tr>
</thead>
<tbody>
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<td>78-78-4</td>
<td>0,1 - 1,0 %</td>
</tr>
</tbody>
</table>

Directive 96/82/EC (Seveso II): on the control of major accident hazards involving dangerous substances:

<table>
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<td>0,1 - 1,0 %</td>
</tr>
</tbody>
</table>

Directive 98/24/EC: on the protection of workers from the risks related to chemical agents at work:
SAFETY DATA SHEET

C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %

Issue date: 07.10.2014
Revision date: 09.10.2014
Version: 1.0
SDS No.: 000010022565

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National Regulations


This Safety Data Sheet has been produced to comply with Regulation (EU) 453/2010.

SECTION 16: Other Information

Revision Information:

Not relevant.

Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
- Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/).
- European Industrial Gases Association (EIGA) Doc. 169 Classification and Labelling guide.
- International Programme on Chemical Safety (http://www.inchem.org/).
- ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
- The ESIS (European Chemical Substances Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
- The European Chemical Industry Council (CEFIC) ERICards.
- Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).
- Substance specific information from suppliers.

Details given in this document are believed to be correct at the time of publication.
EN40 (as amended) Workplace exposure limits.
SAFETY DATA SHEET

**C4H10 0,6 %; C5H12 0,6 %; C3HF7 5 %; C2HF5 20 %; CH2F2 20 %; CH2FCF3 53,8 %**

**Issue date:** 07.10.2014  
**Revision date:** 09.10.2014  
**Version:**  1.0  
**SDS No.:** 000010022565

**Wording of the R-phrases and H-statements in sections 2 and 3**

- **H224**: Extremely flammable liquid and vapour.
- **H280**: Contains gas under pressure; may explode if heated.
- **H304**: May be fatal if swallowed and enters airways.
- **H336**: May cause drowsiness or dizziness.
- **H411**: Toxic to aquatic life with long lasting effects.
- **R12**: Extremely flammable.
- **R51/53**: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- **R65**: Harmful: may cause lung damage if swallowed.
- **R66**: Repeated exposure may cause skin dryness or cracking.
- **R67**: Vapours may cause drowsiness and dizziness

**Training information:**

Users of breathing apparatus must be trained. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Ensure operators understand the hazards.

**Classification according to Regulation (EC) No 1272/2008 as amended**

- Press. Gas  Liq. Gas, H280

**Other information:**

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/ local regulations are observed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Note: When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

**Revision date:** 09.10.2014  
**Disclaimer:**

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.