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

1.1. Product identifier

Product name: REFRIGERANT R513A
Product code: R513A
Synonyms: OPTEON XP10

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

1.3. Details of the supplier of the safety data sheet

Company name: National Refrigerants Ltd
4 Watling Close
Sketchley Meadows Business Park
Hinckley
Leicestershire
LE10 3EZ
United Kingdom
Tel: 01455 630790
Fax: 01455 630791
Email: sds@nationalref.com

1.4. Emergency telephone number

Emergency tel: Carechem24 +44 (0)1865 407333

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Press. Gas: H280

Most important adverse effects: Contains gas under pressure; may explode if heated.

2.2. Label elements

Label elements:
Hazard statements: H280: Contains gas under pressure; may explode if heated.
Hazard pictograms: GHS04: Gas cylinder

Signal words: Warning
Precautionary statements: P403: Store in a well-ventilated place.
P410: Protect from sunlight.
2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

2,3,3,3-TETRAFLUOROPROP-1-EN - REACH registered number(s): 01-0000019665-61

<table>
<thead>
<tr>
<th>EINECS</th>
<th>CAS</th>
<th>PBT / WEL</th>
<th>CLP Classification</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>754-12-1</td>
<td>Substance with a Community workplace exposure limit.</td>
<td>Flam. Gas 1: H220; Press. Gas: H280</td>
<td>50-70%</td>
</tr>
</tbody>
</table>

REFRIGERANT R134A - REACH registered number(s): 01-2119459374-33

<table>
<thead>
<tr>
<th>EINECS</th>
<th>CAS</th>
<th>PBT / WEL</th>
<th>CLP Classification</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>212-377-0</td>
<td>811-97-2</td>
<td>Substance with a Community workplace exposure limit.</td>
<td>Press. Gas: H280</td>
<td>30-50%</td>
</tr>
</tbody>
</table>

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Remove all contaminated clothes and footwear immediately unless stuck to skin. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Do not use hot water. If frostbite has occurred call a physician.

Eye contact: Bathe the eye with running water for 15 minutes. Transfer to hospital for specialist examination.

Ingestion: Not applicable.

Inhalation: Move to fresh air in case of accidental inhalation of vapours. Consult a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: There may be redness or whiteness of the skin in the area of exposure. Frost-bite may occur causing the affected area to become white and numb.

Eye contact: There may be severe pain. May cause permanent damage.

Ingestion: Not applicable.

Inhalation: Inhalation may produce the following symptoms: Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity. Gas reduces oxygen available for breathing. The victim will not realize that he/she is suffocating.

Delayed / immediate effects: May cause cardiac arrhythmia.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Do Not give adraline or similar drugs.

Section 5: Fire-fighting measures
5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used. Alcohol resistant foam. Carbon dioxide. Water spray. Dry chemical powder. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes of hydrogen fluoride.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Turn leaking containers leak-side up to prevent the escape of liquid.

6.2. Environmental precautions

Environmental precautions: The product evaporates readily. Prevent from entering sewers, basements and work pits, or any place where the accumulation can be dangerous. Stop release if safe to do so. Should not be released into the environment.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Material evaporates. Ventilate the area, especially low or enclosed places where heavy vapours might collect.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Ensure there is sufficient ventilation of the area. Ensure there is exhaust ventilation of the area.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Store at a temperature not exceeding 45°C. Keep container tightly closed.

Suitable packaging: Must only be kept in original packaging.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection
8.1. Control parameters

Hazardous ingredients:

**2,3,3,3-TETRAFLUOROPROP-1-EN**

<table>
<thead>
<tr>
<th>State</th>
<th>8 hour TWA</th>
<th>15 min. STEL</th>
<th>8 hour TWA</th>
<th>15 min. STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>500 ppm</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**REFRIGERANT R134A**

<table>
<thead>
<tr>
<th>State</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>4240 mg/m³</td>
</tr>
</tbody>
</table>

**DNEL/PNEC Values**

Hazardous ingredients:

**2,3,3,3-TETRAFLUOROPROP-1-EN**

<table>
<thead>
<tr>
<th>Type</th>
<th>Exposure</th>
<th>Value</th>
<th>Population</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>Inhalation</td>
<td>273 mg/m³</td>
<td>Workers</td>
<td>-</td>
</tr>
<tr>
<td>PNEC</td>
<td>Fresh water</td>
<td>&gt; 0.1 mg/l</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PNEC</td>
<td>Marine water</td>
<td>&gt; 0.01 mg/l</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PNEC</td>
<td>Fresh water sediments</td>
<td>&gt; 1.77 mg/kg</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PNEC</td>
<td>Soil (agricultural)</td>
<td>&gt; 1.54 mg/kg</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**REFRIGERANT R134A**

<table>
<thead>
<tr>
<th>Type</th>
<th>Exposure</th>
<th>Value</th>
<th>Population</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>Inhalation</td>
<td>2476 mg/m³</td>
<td>Workers</td>
<td>Systemic</td>
</tr>
<tr>
<td>DNEL</td>
<td>Inhalation</td>
<td>2476 mg/m³</td>
<td>Consumers</td>
<td>Systemic</td>
</tr>
<tr>
<td>PNEC</td>
<td>Fresh water</td>
<td>0.01 mg/l</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PNEC</td>
<td>Marine water</td>
<td>0.75 mg/l</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PNEC</td>
<td>Microorganisms in sewage treatment</td>
<td>73 mg/l</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

**Engineering measures:** Use only in closed systems. Ensure there is sufficient ventilation of the area. Ensure there is exhaust ventilation of the area.

**Respiratory protection:** Respiratory protection not required. Self-contained breathing apparatus must be available in case of emergency.

**Hand protection:** The suitability for a specific workplace should be discussed with the producers of the protective gloves. Material: Leather gloves. Material: Low temperature resistant gloves.

**Eye protection:** Safety glasses with side-shields. Ensure eye bath is to hand.

**Skin protection:** Protective clothing.

**Environmental:** Gas escapes to be kept to the minimum by engineering processes and operating methods.

[cont...]
Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- **State**: Liquified gas
- **Colour**: Colourless
- **Odour**: Characteristic odour
- **Boiling point/range °C**: -29.2
- **Flammability limits %: lower**: Not applicable.
- **Flammability limits %: upper**: Not applicable.
- **Flash point °C**: Not applicable.
- **Vapour pressure**: 7064 hPa at 25°C
- **Relative density**: 1.17 at 25°C

9.2. Other information

**Other information**: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

**Reactivity**: Stable under recommended transport or storage conditions.

10.2. Chemical stability

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

10.3. Possibility of hazardous reactions

**Hazardous reactions**: Hazardous reactions will not occur under normal transport or storage conditions.

Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

**Conditions to avoid**: Heat. Hot surfaces. Flames.

10.5. Incompatible materials


10.6. Hazardous decomposition products

**Haz. decomp. products**: In combustion emits toxic fumes of hydrogen fluoride.

Section 11: Toxicological information

11.1. Information on toxicological effects

**Hazardous ingredients**:

- **2,3,3,3-TETRAFLUOROPROP-1-EN**

<table>
<thead>
<tr>
<th>GASES</th>
<th>RAT 4H LC50</th>
<th>&gt; 400000 ppmV</th>
</tr>
</thead>
</table>

[cont...]
SAFETY DATA SHEET
REFRIGERANT R513A

REFRIGERANT R134A

| GASES | RAT | 4H LC50 | 567000 ppmV |

Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be redness or whiteness of the skin in the area of exposure. Frost-bite may occur causing the affected area to become white and numb.

Eye contact: There may be severe pain. May cause permanent damage.

Ingestion: Not applicable.

Inhalation: Inhalation may produce the following symptoms: Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity. Gas reduces oxygen available for breathing. The victim will not realize that he/she is suffocating.

Delayed / immediate effects: May cause cardiac arrhythmia.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

2,3,3,3-TETRAFLUOROPROP-1-EN

<table>
<thead>
<tr>
<th>ALGAE</th>
<th>96H LC50</th>
<th>&gt; 100 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daphnia magna</td>
<td>48H EC50</td>
<td>&gt; 83 mg/l</td>
</tr>
<tr>
<td>FISH</td>
<td>96H ErC50</td>
<td>&gt;197 mg/l</td>
</tr>
</tbody>
</table>

REFRIGERANT R134A

<table>
<thead>
<tr>
<th>ALGAE</th>
<th>72H ErC50</th>
<th>118 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daphnia magna</td>
<td>48H EC50</td>
<td>980 mg/l</td>
</tr>
<tr>
<td>RAINBOW TROUT (Oncorhynchus mykiss)</td>
<td>96H LC50</td>
<td>450 mg/l</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Persistence and degradability: Biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: No data available.

12.4. Mobility in soil

Mobility: Volatile.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Ozone Depletion Potential (ODP): 0 (R11 = 1) R513A: Global Warming Optential = 631 (CO2=1) Contains fluoronated greenhouse gases covered by the Kyoto Protocol.

[cont...]
**SAFETY DATA SHEET**  
**REFRIGERANT R513A**

### Section 13: Disposal considerations

13.1. Waste treatment methods

**Disposal operations:** Product evaporates. Recover to a recovery cylinder and return to a refrigerant recovery facility.

**Recovery operations:** Consult manufacturer or supplier for information regarding recovery and recycling of the product. If recovery is not possible, incinerate at a licenced installation.

**Disposal of packaging:** Return to supplier.

**NB:** The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

### Section 14: Transport information

14.1. UN number

**UN number:** UN3163

14.2. UN proper shipping name

**Shipping name:** LIQUEFIED GAS, N.O.S.  
(1,1,1,2-TETRAFLUOROETHANE; 2,3,3,3-TETRAFLUOROPROP-1-EN)

14.3. Transport hazard class(es)

**Transport class:** 2

14.4. Packing group

14.5. Environmental hazards

**Environmentally hazardous:** No  
**Marine pollutant:** No

14.6. Special precautions for user

**Special precautions:** No special precautions.

**Tunnel code:** C/E  
**Transport category:** 3

### Section 15: Regulatory information

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

**Specific regulations:** Not applicable.

15.2. Chemical Safety Assessment

**Chemical safety assessment:** A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

### Section 16: Other information

**Other information:** This safety data sheet is prepared in accordance with Commission Regulation (EU) No
2015/830.

* indicates text in the SDS which has changed since the last revision.

**Phrases used in s.2 and s.3:**

H220: Extremely flammable gas.

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

**Legal disclaimer:**

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