SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Opteon™ XL55 (R-452B) Refrigerant

Version  3.3  Revision Date: 13.12.2017  SDS Number: 1354803-00034  Date of last issue: 20.11.2017
Date of first issue: 27.02.2017

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

1.1 Product identifier
Trade name : Opteon™ XL55 (R-452B) Refrigerant
SDS-Identcode : 130000143544

1.2 Relevant identified uses of the substance or mixture and uses advised against
Use of the Substance/Mixture : Refrigerant
Recommended restrictions on use : For professional and industrial installation and use only., Do not use product for anything outside of the above specified uses

1.3 Details of the supplier of the safety data sheet
Company : Chemours Netherlands B.V.
Baanhoekweg 22
3313 LA Dordrecht  Netherlands
Telephone : +31-(0)-78-630-1011
Telefax : +31-78-6163737
E-mail address of person responsible for the SDS : sds-support@chemours.com

1.4 Emergency telephone number
+(44)-870-8200418 (CHEMTREC - Recommended)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification (REGULATION (EC) No 1272/2008)
Flammable gases, Category 1  H220: Extremely flammable gas.
Gases under pressure, Liquefied gas  H280: Contains gas under pressure; may explode if heated.

2.2 Label elements
Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms :
Signal word: Danger

Hazard statements:
- H220 Extremely flammable gas.
- H280 Contains gas under pressure; may explode if heated.

Precautionary statements:
**Prevention:**
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

**Response:**
- P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- P381 In case of leakage, eliminate all ignition sources.

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

Additional Labelling:
Contains fluorinated greenhouse gases. (HFC-32, HFC-125)

2.3 Other hazards
This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).
This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).
May displace oxygen and cause rapid suffocation.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.
Rapid evaporation of the product may cause frostbite.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No. Index-No. Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difluoromethane*</td>
<td>75-10-5 200-839-4 01-2119471312-47</td>
<td>Flam. Gas 1; H220 Press. Gas Liquefied gas; H280</td>
<td>67</td>
</tr>
<tr>
<td>2,3,3,3-Tetrafluoropropene*</td>
<td>754-12-1 468-710-7 01-0000019665-61</td>
<td>Flam. Gas 1; H220 Press. Gas Liquefied gas; H280</td>
<td>26</td>
</tr>
<tr>
<td>Pentafluoroethane*</td>
<td>354-33-6 206-557-8 01-2119485636-25</td>
<td>Press. Gas Liquefied gas; H280</td>
<td>7</td>
</tr>
</tbody>
</table>

* Voluntarily-disclosed non-hazardous substance
SECTION 4: First aid measures

4.1 Description of first aid measures

General advice: In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders: No special precautions are necessary for first aid responders.

If inhaled: If inhaled, remove to fresh air. Get medical attention if symptoms occur.

In case of skin contact: Thaw frosted parts with lukewarm water. Do not rub affected area. Get medical attention immediately.

In case of eye contact: Get medical attention immediately.

If swallowed: Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms: May cause cardiac arrhythmia.

Other symptoms potentially related to misuse or inhalation abuse are:
- Cardiac sensitisation
- Anaesthetic effects
- Light-headedness
- Dizziness
- Confusion
- Lack of coordination
- Drowsiness
- Unconsciousness

Risks: Contact with liquid or refrigerated gas can cause cold burns and frostbite.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Water spray
- Alcohol-resistant foam
- Carbon dioxide (CO2)
Safer Data Sheet

according to Regulation (EC) No. 1907/2006

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Dry chemical

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting:
- Vapours may form flammable mixture with air
- Exposure to combustion products may be a hazard to health.
- If the temperature rises there is danger of the vessels bursting due to the high vapor pressure.

Hazardous combustion products:
- Hydrogen fluoride
- Carbonyl fluoride
- Carbon oxides
- Fluorine compounds

5.3 Advice for firefighters

Special protective equipment for firefighters:
- Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

Specific extinguishing methods:
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Fight fire remotely due to the risk of explosion.
- Use water spray to cool unopened containers.
- Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- Remove undamaged containers from fire area if it is safe to do so.
- Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions:
- Evacuate personnel to safe areas.
- Only trained personnel should re-enter the area.
- Remove all sources of ignition.
- Avoid skin contact with leaking liquid (danger of frostbite).
- Ventilate the area.
- Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions

Environmental precautions:
- Prevent further leakage or spillage if safe to do so.
- Retain and dispose of contaminated wash water.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up:
- Ventilate the area.
- Non-sparking tools should be used.
- Suppress (knock down) gases/vapours/mists with a water
spray jet. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections
See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures: Use equipment rated for cylinder pressure. Use a backflow preventative device in piping. Close valve after each use and when empty.

Local/Total ventilation: Use with local exhaust ventilation. Use only in an area equipped with explosion-proof exhaust ventilation if advised by assessment of the local exposure potential.

Advice on safe handling: Avoid breathing gas. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Never attempt to lift cylinder by its cap. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Keep container tightly closed. Wear cold insulating gloves/ face shield/ eye protection. Prevent backflow into the gas tank. Open the valves slowly to prevent pressure surges. Close valve after each use and when empty. Do NOT change or force fit connections. Prevent the intrusion of water into the gas tank. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures: Ensure that eye flushing systems and safety showers are located close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.
7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Do not store near combustible materials. Avoid area where salt or other corrosive materials are present. Keep in properly labelled containers. Keep tightly closed. Keep in a cool, well-ventilated place. Keep away from direct sunlight. Store in accordance with the particular national regulations. Keep away from heat and sources of ignition.

Advice on common storage: Do not store with the following product types:
- Self-reactive substances and mixtures
- Organic peroxides
- Oxidizing agents
- Flammable liquids
- Flammable solids
- Pyrophoric liquids
- Pyrophoric solids
- Self-heating substances and mixtures
- Substances and mixtures, which in contact with water, emit flammable gases
- Explosives
- Acutely toxic substances and mixtures
- Substances and mixtures with chronic toxicity

Storage period: > 10 yr

Recommended storage temperature: < 52 °C

Further information on storage stability: The product has an indefinite shelf life when stored properly.

7.3 Specific end use(s)
Specific use(s): No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difluoromethane</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>7035 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>750 mg/m³</td>
</tr>
<tr>
<td>2,3,3,3-Tetrafluoropropene</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>950 mg/m³</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentafluoroethane</td>
<td>Fresh water</td>
<td>0.1 mg/l</td>
</tr>
<tr>
<td>Intermittent use/release</td>
<td></td>
<td>1 mg/l</td>
</tr>
<tr>
<td>Fresh water sediment</td>
<td></td>
<td>0.6 mg/kg</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Engineering measures
Minimize workplace exposure concentrations. Use only in an area equipped with explosion-proof exhaust ventilation if advised by assessment of the local exposure potential. Use with local exhaust ventilation.

Personal protective equipment

Eye protection: Wear the following personal protective equipment:
Chemical resistant goggles must be worn.
Face-shield

Hand protection
Material: Heat resistant gloves

Remarks: Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!
Skin and body protection: Wear the following personal protective equipment:
Flame retardant antistatic protective clothing, unless assessment demonstrates that the risk of explosive atmospheres or flash fires is low.

Respiratory protection: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Filter type: Organic gas and low boiling vapour type (AX)

Protective measures: Wear cold insulating gloves/face shield/eye protection.

**SECTION 9: Physical and chemical properties**

**9.1 Information on basic physical and chemical properties**

- **Appearance**: Liquefied gas
- **Colour**: clear, colourless
- **Odour**: slight, ether-like
- **Odour Threshold**: No data available
- **pH**: No data available
- **Melting point/freezing point**: No data available
- **Initial boiling point and boiling range**: -51 °C
- **Flash point**: Not applicable
- **Evaporation rate**: > 1 (CCL4=1.0)
- **Flammability (solid, gas)**: Flammable
- **Upper explosion limit / Upper flammability limit**: Upper flammability limit 23.3 % (V) Method: ASTM E681
- **Lower explosion limit / Lower flammability limit**: Lower flammability limit 12 % (V) Method: ASTM E681
- **Vapour pressure**: 15,987 hPa (25 °C)
- **Relative vapour density**: No data available
- **Relative density**: 0.99 (25 °C)
Density : 0.99 g/cm³ (25 °C)

Solubility(ies):
Water solubility : No data available

Partition coefficient: n-octanol/water : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity:
Viscosity, kinematic : Not applicable

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

### 9.2 Other information

- Particle size : Not applicable

### SECTION 10: Stability and reactivity

#### 10.1 Reactivity
Not classified as a reactivity hazard.

#### 10.2 Chemical stability
Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.

#### 10.3 Possibility of hazardous reactions

- Hazardous reactions:
  - Vapours may form flammable mixture with air
  - Can react with strong oxidizing agents.
  - Extremely flammable gas.

#### 10.4 Conditions to avoid
- Conditions to avoid: Heat, flames and sparks.

#### 10.5 Incompatible materials
- Materials to avoid: Oxidizing agents

#### 10.6 Hazardous decomposition products
No hazardous decomposition products are known.

### SECTION 11: Toxicological information

#### 11.1 Information on toxicological effects
Information on likely routes of exposure:
- Inhalation
- Skin contact
- Eye contact

Acute toxicity
Not classified based on available information.

Components:

**Difluoromethane:**
Acute inhalation toxicity:
- LC50 (Rat): > 520000 ppm
- Exposure time: 4 h
- Test atmosphere: gas
- Lowest observed adverse effect concentration (Dog): > 350000 ppm
- Symptoms: Cardiac sensitisation
- No observed adverse effect concentration (Dog): 350000 ppm
- Symptoms: Cardiac sensitisation
- Cardiac sensitisation threshold limit (Dog): > 735,000 mg/m³
  Symptoms: Cardiac sensitisation

**2,3,3,3-Tetrafluoropropene:**
Acute inhalation toxicity:
- LC50 (Rat): > 405000 ppm
- Exposure time: 4 h
- Test atmosphere: gas
- Lowest observed adverse effect concentration (Dog): > 120000 ppm
  Test atmosphere: gas
  Symptoms: Cardiac sensitisation
- No observed adverse effect concentration (Dog): 120000 ppm
  Test atmosphere: gas
  Symptoms: Cardiac sensitisation
- Cardiac sensitisation threshold limit (Dog): > 559,509 mg/m³
  Test atmosphere: gas
  Symptoms: Cardiac sensitisation

**Pentafluoroethane:**
Acute inhalation toxicity:
- LC0 (Rat): > 800000 ppm
  Exposure time: 4 h
  Test atmosphere: gas
  Method: OECD Test Guideline 403

Skin corrosion/irritation
Not classified based on available information.
Components:

Difluoromethane:
Species: Not tested on animals
Result: No skin irritation

2,3,3,3-Tetrafluoropropene:
Species: Not tested on animals
Result: No skin irritation

Serious eye damage/eye irritation
Not classified based on available information.

Components:

Difluoromethane:
Species: Not tested on animals
Result: No eye irritation

2,3,3,3-Tetrafluoropropene:
Species: Not tested on animals
Result: No eye irritation

Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

Difluoromethane:
Exposure routes: Skin contact
Species: Not tested on animals
Result: negative
Species: Not tested on animals
Result: negative

2,3,3,3-Tetrafluoropropene:
Exposure routes: Skin contact
Species: Not tested on animals
Result: negative

Germ cell mutagenicity
Not classified based on available information.
Components:

Difluoromethane:
Germ cell mutagenicity - Assessment: Weight of evidence does not support classification as a germ cell mutagen.

2,3,3,3-Tetrafluoropropene:
Germ cell mutagenicity - Assessment: Weight of evidence does not support classification as a germ cell mutagen.

Pentafluoroethane:
Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: inhalation (gas)
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
Not classified based on available information.

Components:

2,3,3,3-Tetrafluoropropene:
Carcinogenicity - Assessment: Weight of evidence does not support classification as a carcinogen

Reproductive toxicity
Not classified based on available information.

Components:

Difluoromethane:
Reproductive toxicity - Assessment: Weight of evidence does not support classification for reproductive toxicity, Based on data from similar materials

2,3,3,3-Tetrafluoropropene:
Reproductive toxicity - Assessment: Weight of evidence does not support classification for reproductive toxicity

Pentafluoroethane:
Effects on fertility: Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapour)
Result: negative
Remarks: Based on data from similar materials
Effects on foetal development:
Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 414
Result: negative

STOT - single exposure
Not classified based on available information.

STOT - repeated exposure
Not classified based on available information.

Components:

Difluoromethane:
Assessment: No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

2,3,3,3-Tetrafluoropropene:
Assessment: No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

Repeated dose toxicity

Components:

Difluoromethane:
Species: Rat
NOAEL: 49100 ppm
Application Route: inhalation (gas)
Exposure time: 90 d
Remarks: No significant adverse effects were reported

2,3,3,3-Tetrafluoropropene:
Species: Rat
NOAEL: 50000 ppm
LOAEL: >50000 ppm
Application Route: inhalation (gas)
Exposure time: 90 d
Method: OECD Test Guideline 413
Remarks: No significant adverse effects were reported

Pentafluoroethane:
Species: Rat
NOAEL: >= 50000 ppm
Application Route: inhalation (gas)
Exposure time: 13 Weeks
Method: OECD Test Guideline 413
Aspiration toxicity
Not classified based on available information.

SECTION 12: Ecological information

12.1 Toxicity

Components:

Difluoromethane:
Toxicity to fish : LC50 (Fish): 1,507 mg/l
       Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia (water flea)): 652 mg/l
       Exposure time: 48 h

Toxicity to algae : EC50 (algae): 142 mg/l
       Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEC: 65.8 mg/l
       Exposure time: 30 d
       Species: Fish

2,3,3,3-Tetrafluoropropene:
Toxicity to fish : LC50 (Cyprinus carpio (Carp)): > 197 mg/l
       Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
       Exposure time: 48 h

Toxicity to algae : NOEC (algae): > 100 mg/l
       Exposure time: 72 h

Pentafluoroethane:
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l
       Exposure time: 96 h
       Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 980 mg/l
       Exposure time: 48 h
       Remarks: Based on data from similar materials

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (green algae)): > 114 mg/l
       Exposure time: 72 h
       Method: OECD Test Guideline 201
       Remarks: Based on data from similar materials

       NOEC (Pseudokirchneriella subcapitata (green algae)): 13.2 mg/l
12.2 Persistence and degradability

**Components:**

**Difluoromethane:**
- Biodegradability: Result: Not readily biodegradable.
- Biodegradation: 5 %
- Exposure time: 28 d
- Method: OECD Test Guideline 301D

**2,3,3,3-Tetrafluoropropene:**
- Biodegradability: Result: Not readily biodegradable.
- Method: OECD Test Guideline 301F

**Pentafluoroethane:**
- Biodegradability: Result: Not readily biodegradable.
- Biodegradation: 5 %
- Exposure time: 28 d
- Method: OECD Test Guideline 301D

12.3 Bioaccumulative potential

**Components:**

**Difluoromethane:**
- Partition coefficient: n-octanol/water: log Pow: 0.714

**2,3,3,3-Tetrafluoropropene:**
- Bioaccumulation: Remarks: No bioaccumulation is to be expected (log Pow <= 4).

**Pentafluoroethane:**
- Partition coefficient: n-octanol/water: Pow: 1.48 (25 °C)

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

**Product:**
- Assessment: This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and very bio-accumulating (vPvB).
12.6 Other adverse effects

Global warming potential

Regulation (EU) No 517/2014 on fluorinated greenhouse gases

Product:
100-year global warming potential: 698.29

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Dispose of in accordance with local regulations.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

Contaminated packaging
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Empty pressure vessels should be returned to the supplier.
If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

<table>
<thead>
<tr>
<th>Code</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>UN 3161</td>
</tr>
<tr>
<td>ADR</td>
<td>UN 3161</td>
</tr>
<tr>
<td>RID</td>
<td>UN 3161</td>
</tr>
<tr>
<td>IMDG</td>
<td>UN 3161</td>
</tr>
<tr>
<td>IATA (Cargo)</td>
<td>UN 3161</td>
</tr>
<tr>
<td>IATA (Passenger)</td>
<td>UN 3161</td>
</tr>
</tbody>
</table>

Not permitted for transport

14.2 UN proper shipping name

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>LIQUEFIED GAS, FLAMMABLE, N.O.S.</td>
</tr>
<tr>
<td></td>
<td>(Difluoromethane, 2,3,3,3-Tetrafluoropropene)</td>
</tr>
<tr>
<td>ADR</td>
<td>LIQUEFIED GAS, FLAMMABLE, N.O.S.</td>
</tr>
<tr>
<td></td>
<td>(Difluoromethane, 2,3,3,3-Tetrafluoropropene)</td>
</tr>
<tr>
<td>RID</td>
<td>LIQUEFIED GAS, FLAMMABLE, N.O.S.</td>
</tr>
<tr>
<td></td>
<td>(Difluoromethane, 2,3,3,3-Tetrafluoropropene)</td>
</tr>
<tr>
<td>IMDG</td>
<td>LIQUEFIED GAS, FLAMMABLE, N.O.S.</td>
</tr>
<tr>
<td></td>
<td>(Difluoromethane, 2,3,3,3-Tetrafluoropropene)</td>
</tr>
<tr>
<td>IATA (Cargo)</td>
<td>Liquefied gas, flammable, n.o.s.</td>
</tr>
<tr>
<td></td>
<td>(Difluoromethane, 2,3,3,3-Tetrafluoropropene)</td>
</tr>
</tbody>
</table>
IATA (Passenger) : LIQUEFIED GAS, FLAMMABLE, N.O.S.
Not permitted for transport

14.3 Transport hazard class(es)

ADN : 2
ADR : 2
RID : 2
IMDG : 2.1
IATA (Cargo) : 2.1
IATA (Passenger) : Not permitted for transport

14.4 Packing group

ADN
Packing group : Not assigned by regulation
Classification Code : 2F
Hazard Identification Number : 23
Labels : 2.1

ADR
Packing group : Not assigned by regulation
Classification Code : 2F
Hazard Identification Number : 23
Labels : 2.1
Tunnel restriction code : (B/D)

RID
Packing group : Not assigned by regulation
Classification Code : 2F
Hazard Identification Number : 23
Labels : 2.1

IMDG
Packing group : Not assigned by regulation
Labels : 2.1
EmS Code : F-D, S-U

IATA (Cargo)
Packing instruction (cargo aircraft) : 200
Packing group : Not assigned by regulation
Labels : Flammable Gas

IATA (Passenger) : Not permitted for transport

14.5 Environmental hazards

ADN
Environmentally hazardous : no

ADR
Environmentally hazardous : no

RID
Environmentally hazardous : no
IMDG
Marine pollutant : no

14.6 Special precautions for user
Not applicable

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable


Other regulations:
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

15.2 Chemical safety assessment
Chemical Safety Assessments have been carried out for these substances.

SECTION 16: Other information

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Full text of H-Statements
H220: Extremely flammable gas.
H280: Contains gas under pressure; may explode if heated.

Full text of other abbreviations
Flam. Gas: Flammable gases
Press. Gas: Gases under pressure

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCDS - Technical Code for Domestic Substances Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture: Based on product data or assessment

Classification procedure:
Flam. Gas 1 H220
Press. Gas Liquefied gas H280

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Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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