SAFETY DATA SHEET
Qualitative Natural Gas Sample, Part Number 5080-8756

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

1.1 Product identifier
Product name : Qualitative Natural Gas Sample, Part Number 5080-8756
Part No. : 5080-8756

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

<table>
<thead>
<tr>
<th>Identified uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research.</td>
</tr>
<tr>
<td>4.25 L</td>
</tr>
<tr>
<td>Container type: cylinder</td>
</tr>
</tbody>
</table>

1.3 Details of the supplier of the safety data sheet
Agilent Technologies Manufacturing GmbH & Co. KG
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000
e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number
Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Product definition : Mixture
Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
H220 : FLAMMABLE GASES - Category 1
H280 : GASES UNDER PRESSURE - Compressed gas

Ingredients of unknown toxicity : Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 1%
Ingredients of unknown ecotoxicity : Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 1%
See Section 16 for the full text of the H statements declared above.
See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements
Hazard pictograms : 

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

Date of issue/Date of revision : 29/12/2016
Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - United Kingdom (UK)

Qualitative Natural Gas Sample, Part Number 5080-8756

SECTION 2: Hazards identification

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 - Eliminate all ignition sources if safe to do so.
Storage : P410 - Protect from sunlight.
Disposal : Not applicable.

Supplemental label elements

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Special packaging requirements

Tactile warning of danger : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : Acts as a simple asphyxiant. At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Identifiers</th>
<th>%</th>
<th>Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>EC: 203-448-7\nCAS: 106-97-8\nIndex: 601-004-00-0\nEC: 203-692-4\nCAS: 109-66-0\nIndex: 601-006-00-1</td>
<td>≤5</td>
<td>Flam. Gas 1, H220\nPress. Gas Comp. Gas, H280</td>
</tr>
<tr>
<td>pentane</td>
<td>EC: 203-692-4\nCAS: 109-66-0\nIndex: 601-006-00-1</td>
<td>≤1.2</td>
<td>Flam. Liq. 2, H225\nSTOT SE 3, H336\nAsp. Tox. 1, H304\nAquatic Chronic 2, H411\nEUH066</td>
</tr>
<tr>
<td>Isopentane</td>
<td>EC: 201-142-8\nCAS: 78-78-4\nIndex: 601-085-00-2</td>
<td>≤1.2</td>
<td>Flam. Liq. 1, H224\nSTOT SE 3, H336\nAsp. Tox. 1, H304\nAquatic Chronic 2, H411\nEUH066</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>EC: 204-696-9\nCAS: 124-38-9\nEC: 203-777-6\nCAS: 110-54-3\nIndex: 601-037-00-0</td>
<td>≤3</td>
<td>Flam. Liq. 2, H225\nSkIn Irrit. 2, H315\nRepr. 2, H361f (Fertility)\nSTOT SE 3, H336\nSTOT RE 2, H373\nAsp. Tox. 1, H304\nAquatic Chronic 2, H411</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>EC: 203-777-6\nCAS: 110-54-3\nIndex: 601-037-00-0</td>
<td>&lt;1</td>
<td>Flam. Liq. 2, H225\nSkin Irrit. 2, H315\nRepr. 2, H361f (Fertility)\nSTOT SE 3, H336\nSTOT RE 2, H373\nAsp. Tox. 1, H304\nAquatic Chronic 2, H411</td>
</tr>
</tbody>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Date of issue/Date of revision : 29/12/2016
SECTION 3: Composition/information on ingredients

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[5] Substance of equivalent concern

SECTION 4: First aid measures

4.1 Description of first aid measures

**Eye contact**: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

**Inhalation**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or wristband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Skin contact**: Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**: As this product is a gas, refer to the inhalation section.

**Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

**Potential acute health effects**

**Eye contact**: Contact with rapidly expanding gas may cause burns or frostbite.

**Inhalation**: At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

**Skin contact**: Contact with rapidly expanding gas may cause burns or frostbite.

**Ingestion**: As this product is a gas, refer to the inhalation section.

**Over-exposure signs/symptoms**

**Eye contact**: No specific data.

**Inhalation**: No specific data.

**Skin contact**: No specific data.

**Ingestion**: No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

**Notes to physician**: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments**: No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

**Suitable extinguishing media**: Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media**: None known.
Qualitative Natural Gas Sample, Part Number 5080-8756

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - United Kingdom (UK)

SECTION 5: Firefighting measures

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products: Decomposition products may include the following materials:
- carbon dioxide
- carbon monoxide
- nitrogen oxides

5.3 Advice for firefighters

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Additional information: Container explosion may occur under fire conditions or when heated.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders: If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions: Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

6.4 Reference to other sections: See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

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SECTION 7: Handling and storage

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use.

Seveso Directive - Reporting thresholds (in tonnes)

<table>
<thead>
<tr>
<th>Name</th>
<th>Notification and MAPP threshold</th>
<th>Safety report threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
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<td>50</td>
<td>200</td>
</tr>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
<td>50</td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Notification and MAPP threshold</th>
<th>Safety report threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2: Flammable gases</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

7.3 Specific end use(s)

Recommendations: Industrial applications, Professional applications.

Industrial sector specific solutions: Not applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Exposure limit values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 1810 mg/m³ 8 hours. TWA: 600 ppm 8 hours.</td>
</tr>
<tr>
<td>pentane</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 600 ppm 8 hours. TWA: 1800 mg/m³ 8 hours.</td>
</tr>
<tr>
<td>Isopentane</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 600 ppm 8 hours. TWA: 1800 mg/m³ 8 hours.</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 27400 mg/m³ 15 minutes. TWA: 9150 mg/m³ 8 hours. TWA: 5000 ppm 8 hours.</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 72 mg/m³ 8 hours. TWA: 20 ppm 8 hours.</td>
</tr>
</tbody>
</table>

Date of issue/Date of revision: 29/12/2016
SECTION 8: Exposure controls/personal protection

Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs
No DNELs/DMELs available.

PNECs
No PNECs available

8.2 Exposure controls

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: The gas can cause asphyxiation without warning by replacing the oxygen in the air. Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. If operating conditions cause high gas concentrations to be produced or any recommended or statutory exposure limit is exceeded, use an air-fed respirator or self-contained breathing apparatus. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on
Qualitative Natural Gas Sample, Part Number 5080-8756

SECTION 8: Exposure controls/personal protection

Environmental exposure controls

known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state: Gas.
- Colour: Colourless.
- Odour: Odourless.
- Odour threshold: Not available.
- pH: Not available.
- Melting point/freezing point: Not available.
- Initial boiling point and boiling range: -161°C
- Flash point: Closed cup: -183°C
- Evaporation rate: Not available.
- Flammability (solid, gas): Container explosion may occur under fire conditions or when heated.

Upper/lower flammability or explosive limits

- Lower: 5%
- Upper: 14%
- Vapour pressure: Not available.
- Vapour density: 0.555 [Air = 1]
- Relative density: 0.7168
- Solubility(ies): Not available.
- Partition coefficient: n-octanol/water: Not available.
- Auto-ignition temperature: 650°C
- Decomposition temperature: Not available.
- Viscosity: Not available.
- Explosive properties: Not available.
- Oxidising properties: Not available.

9.2 Other information

- Solubility in water: 0.002 g/l
- No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity

- No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

- The product is stable.

10.3 Possibility of hazardous reactions

- Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

- Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas.

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SECTION 10: Stability and reactivity

10.5 Incompatible materials : May react or be incompatible with oxidising materials.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>pentane</td>
<td>LC50 Inhalation Vapour</td>
<td>Rat</td>
<td>364 g/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>Isopentane</td>
<td>LC50 Inhalation Vapour</td>
<td>Rat</td>
<td>280000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>LC50 Inhalation Vapour</td>
<td>Rat</td>
<td>48000 ppm</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>15840 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Acute toxicity estimates

Not available.

Irritation/Corrosion

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>10 milligrams</td>
<td>-</td>
</tr>
</tbody>
</table>

Sensitiser

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>pentane</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>Isopentane</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Narcotic effects</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Hexane</td>
<td>Category 2</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

Aspiration hazard

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>pentane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>Isopentane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>ASPIRATION HAZARD - Category 1</td>
</tr>
</tbody>
</table>

Information on likely routes of exposure : Routes of entry anticipated: Inhalation.

Potential acute health effects

Inhalation : At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

Ingestion : As this product is a gas, refer to the inhalation section.

Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.

Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : No specific data.

Ingestion : No specific data.

Skin contact : No specific data.

Eye contact : No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

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SECTION 11: Toxicological information

Short term exposure
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Long term exposure
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Potential chronic health effects
- General: No known significant effects or critical hazards.
- Carcinogenicity: No known significant effects or critical hazards.
- Mutagenicity: No known significant effects or critical hazards.
- Teratogenicity: No known significant effects or critical hazards.
- Developmental effects: No known significant effects or critical hazards.
- Fertility effects: No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentane</td>
<td>Acute EC50 2.3 mg/l</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 3.1 mg/l</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 113000 µg/l</td>
<td>Fish - Oreochromis mossambicus</td>
<td>96 hours</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>Acute LC50 113000 µg/l</td>
<td>Fresh water</td>
<td></td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability
Not available.

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentane</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
</tbody>
</table>

12.3 Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP&lt;sub&gt;ow&lt;/sub&gt;</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentane</td>
<td>3.45</td>
<td>171</td>
<td>low</td>
</tr>
<tr>
<td>Isopentane</td>
<td>3</td>
<td>171</td>
<td>low</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>0.83</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>4</td>
<td>501.187</td>
<td>high</td>
</tr>
</tbody>
</table>

12.4 Mobility in soil
- Soil/water partition coefficient (K<sub>oc</sub>): Not available.
- Mobility: Not available.

12.5 Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

12.6 Other adverse effects: No known significant effects or critical hazards.

Date of issue/Date of revision: 29/12/2016
SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste

Packaging

Methods of disposal: The classification of the product may meet the criteria for a hazardous waste.

Special precautions: The generation of waste should be avoided or minimised wherever possible. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

SECTION 14: Transport information

<table>
<thead>
<tr>
<th></th>
<th>ADR/RID</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1 UN number</td>
<td>UN1971</td>
<td>UN1971</td>
<td>UN1971</td>
</tr>
<tr>
<td>14.2 UN proper shipping name</td>
<td>NATURAL GAS, COMPRESSED</td>
<td>NATURAL GAS, COMPRESSED</td>
<td>Natural gas, compressed</td>
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<tr>
<td>14.3 Transport hazard class(es)</td>
<td>2</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Flammable" /></td>
<td><img src="image" alt="Flammable" /></td>
<td><img src="image" alt="Flammable" /></td>
</tr>
<tr>
<td>14.4 Packing group</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.5 Environmental hazards</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
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</table>

**Additional information**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited quantity</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special provisions</td>
<td>660, 662</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tunnel code</td>
<td>(B/D)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**14.6 Special precautions for user**

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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SECTION 14: Transport information

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code: Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles: Not applicable.

Other EU regulations

Europe inventory: All components are listed or exempted.

Industrial emissions (integrated pollution prevention and control) - Air: Listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Named substances

<table>
<thead>
<tr>
<th>Name</th>
<th>Danger criteria</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
<td>P2: Flammable gases</td>
<td></td>
</tr>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
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<td></td>
</tr>
<tr>
<td>Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

National regulations

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>List name</th>
<th>Name on list</th>
<th>Classification</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>butane</td>
<td>UK Occupational Exposure Limits EH40 - WEL</td>
<td>butane</td>
<td>Carc.</td>
<td>-</td>
</tr>
</tbody>
</table>

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

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SECTION 15: Regulatory information

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

International lists

National inventory

Australia : All components are listed or exempted.
Canada : All components are listed or exempted.
China : All components are listed or exempted.
Japan : Japan inventory (ENCS): All components are listed or exempted.
Japan inventory (ISHL): Not determined.
Malaysia : Not determined.
New Zealand : All components are listed or exempted.
Philippines : All components are listed or exempted.
Republic of Korea : All components are listed or exempted.
Taiwan : All components are listed or exempted.
Turkey : Not determined.
United States : All components are listed or exempted.

15.2 Chemical safety assessment
This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms

ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flam. Gas 1, H220</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>Press. Gas Comp. Gas, H280</td>
<td>On basis of test data</td>
</tr>
</tbody>
</table>

Full text of abbreviated H statements

H220: Extremely flammable gas.
H224: Extremely flammable liquid and vapour.
H225: Highly flammable liquid and vapour.
H280: Contains gas under pressure; may explode if heated.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H361f: Suspected of damaging fertility.
H373: May cause damage to organs through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

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SECTION 16: Other information

Aquatic Chronic 2, H411
Asp. Tox. 1, H304
EUH066
Flam. Gas 1, H220
Flam. Liq. 1, H224
Flam. Liq. 2, H225
Press. Gas Comp. Gas, H280
Repr. 2, H361f
Skin Irrit. 2, H315
STOT RE 2, H373
STOT SE 3, H336

LONG-TERM AQUATIC HAZARD - Category 2
ASPIRATION HAZARD - Category 1
Repeated exposure may cause skin dryness or cracking.
FLAMMABLE GASES - Category 1
FLAMMABLE LIQUIDS - Category 1
FLAMMABLE LIQUIDS - Category 2
GASES UNDER PRESSURE - Compressed gas
REPRODUCTIVE TOXICITY (Fertility) - Category 2
SKIN CORROSION/IRRITATION - Category 2
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) - Category 3

Date of issue/Date of revision : 29/12/2016
Date of previous issue : 23/02/2016.
Version : 1.1

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