SAFETY DATA SHEET
ArcticExpress (DE3)RIL Competent Cells, Part Number 230193

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

1.1 Product identifier
Product name : ArcticExpress (DE3)RIL Competent Cells, Part Number 230193
Part No. (Kit) : 230193
Part No. : pUC 18 DNA Control
            Plasmid
            XL10-Gold
            2-Mercaptoethanol
            ArcticExpress (DE3)RIL competent cells

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>Analytical reagent.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</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 : pUC 18 DNA Control Plasmid
                     XL10-Gold
                     2-Mercaptoethanol
                     ArcticExpress (DE3)RIL competent cells

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
XL10-Gold 2-Mercaptoethanol
H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317 SKIN SENSITISATION - Category 1
H412 LONG-TERM AQUATIC HAZARD - Category 3

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
Date of issue/Date of revision : 14/10/2016

SECTION 2: Hazards identification

Hazard pictograms:

Signal word:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells
  - No signal word.

Hazard statements:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
  - GHS05 - Causes serious eye damage.
  - GHS07 - May cause an allergic skin reaction. Harmful to aquatic life with long lasting effects.
  - Not applicable.

Precautionary statements:

Prevention:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
  - P280 - Wear protective gloves. Wear eye or face protection.
  - P273 - Avoid release to the environment.
  - Not applicable.

Response:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
  - P305 + P351 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTER or physician.
  - Not applicable.

Storage:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells
  - Not applicable.

Disposal:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells
  - P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
  - Not applicable.

Hazardous ingredients:
- XL10-Gold
- 2-Mercaptoethanol

Supplemental label elements:
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells
  - Not applicable.

Date of issue/Date of revision: 14/10/2016
ArcticExpress (DE3)RIL Competent Cells, Part Number 230193

SECTION 2: Hazards identification

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

Special packaging requirements

<table>
<thead>
<tr>
<th>Tactile warning of danger</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Not applicable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>Not applicable.</td>
<td></td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>Not applicable.</td>
<td></td>
</tr>
</tbody>
</table>

2.3 Other hazards

<table>
<thead>
<tr>
<th>Other hazards which do not result in classification</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>None known.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>None known.</td>
<td></td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>None known.</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Identifiers</th>
<th>Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
</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 and hence require reporting in this section.

Type

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

Date of issue/Date of revision: 14/10/2016
SECTION 4: First aid measures

4.1 Description of first aid measures

**Eye contact**

- **pUC 18 DNA Control Plasmid**
  - Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

- **XL10-Gold 2-Mercaptoethanol**
  - Get medical attention immediately. Call a poison center or physician. 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. Chemical burns must be treated promptly by a physician.

- **ArcticExpress (DE3)RIL competent cells**
  - Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

**Inhalation**

- **pUC 18 DNA Control Plasmid**
  - Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

- **XL10-Gold 2-Mercaptoethanol**
  - Get medical attention immediately. Call a poison center or physician. 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. 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 waistband.

- **ArcticExpress (DE3)RIL competent cells**
  - Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

**Skin contact**

- **pUC 18 DNA Control Plasmid**
  - Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

- **XL10-Gold 2-Mercaptoethanol**
  - Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

- **ArcticExpress (DE3)RIL competent cells**
  - Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

**Ingestion**

- **pUC 18 DNA Control Plasmid**
  - Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

- **XL10-Gold 2-Mercaptoethanol**
  - Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an
SECTION 4: First aid measures

ArcticExpress (DE3)RIL competent cells

unconscious person. 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 waistband. Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Protection of first-aiders

ArcticExpress (DE3)RIL competent cells

No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Inhalation

ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

Ingestion

ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

Skin contact

ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

Eye contact

ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact

ArcticExpress (DE3)RIL competent cells

No specific data.

Adverse symptoms may include the following:

- pain
- watering
- redness

No specific data.
## SECTION 4: First aid measures

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>No specific data.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XL10-Gold</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>2-Mercaptoethanol</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

### Skin contact

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>No specific data.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>Adverse symptoms may include the following:</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>pain or irritation</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>redness</td>
</tr>
<tr>
<td></td>
<td>blistering may occur</td>
</tr>
</tbody>
</table>

### Ingestion

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>No specific data.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>Adverse symptoms may include the following:</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>stomach pains</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td></td>
</tr>
</tbody>
</table>

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

#### Notes to physician

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td></td>
</tr>
</tbody>
</table>

#### Specific treatments

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>No specific treatment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>No specific treatment.</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>No specific treatment.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

#### Suitable extinguishing media

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>Use an extinguishing agent suitable for the surrounding fire.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td></td>
</tr>
</tbody>
</table>

#### Unsuitable extinguishing media

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>None known.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>None known.</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>None known.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td></td>
</tr>
</tbody>
</table>

### 5.2 Special hazards arising from the substance or mixture

<table>
<thead>
<tr>
<th>pUC 18 DNA Control Plasmid</th>
<th>In a fire or if heated, a pressure increase will occur and the container may burst.</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>In a fire or if heated, a pressure increase will occur and the</td>
</tr>
</tbody>
</table>
## SECTION 5: Firefighting measures

<table>
<thead>
<tr>
<th>Hazardous combustion products</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Decomposition products may include the following materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XL10-Gold</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td></td>
<td>2-Mercaptoethanol</td>
<td>carbon monoxide</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL</td>
<td>Competent cells</td>
<td>sulfur oxides</td>
</tr>
<tr>
<td>Competent cells</td>
<td></td>
<td>halogenated compounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>metal oxide/oxides</td>
</tr>
</tbody>
</table>

- No specific data.

### 5.3 Advice for firefighters

<table>
<thead>
<tr>
<th>Special precautions for fire-fighters</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XL10-Gold</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>2-Mercaptoethanol</td>
<td>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.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL Competent cells</td>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

<table>
<thead>
<tr>
<th>For non-emergency personnel</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XL10-Gold</td>
<td>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</td>
</tr>
<tr>
<td></td>
<td>2-Mercaptoethanol</td>
<td>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL</td>
<td>Competent cells</td>
<td>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</td>
</tr>
</tbody>
</table>

### Date of issue/Date of revision

- 14/10/2016
## SECTION 6: Accidental release measures

### 6.2 Environmental precautions

<table>
<thead>
<tr>
<th>Product</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</td>
</tr>
</tbody>
</table>

### 6.3 Methods and material for containment and cleaning up

<table>
<thead>
<tr>
<th>Methods for cleaning up</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.</td>
</tr>
<tr>
<td>ArcticExpress (DE3)RIL competent cells</td>
<td>Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.</td>
</tr>
</tbody>
</table>

### 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
## SECTION 7: Handling and storage

<table>
<thead>
<tr>
<th>Protective measures</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ArcticExpress (DE3)RIL competent cells</strong></td>
<td>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.</td>
</tr>
<tr>
<td><strong>pUC 18 DNA Control Plasmid</strong></td>
<td>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.</td>
</tr>
<tr>
<td><strong>XL10-Gold 2-Mercaptoethanol</strong></td>
<td>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.</td>
</tr>
</tbody>
</table>

### 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.

- **Potentially biohazardous material.** 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.
SECTION 7: Handling and storage

7.3 Specific end use(s)

**Recommendations**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

**Industrial sector specific solutions**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

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>ArcticExpress (DE3)RIL competent cells</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m³ 8 hours. Form: Mist</td>
</tr>
<tr>
<td>Glycerol</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m³ 15 minutes. TWA: 10 mg/m³ 8 hours.</td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
</tr>
</tbody>
</table>

**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**

- If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Individual protection measures**

**Hygiene measures**

- Handle as biohazard material (Biosafety level 1). 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. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
SECTION 8: Exposure controls/personal protection

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: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Training in the use of respiratory protection is necessary. Each employee should be trained in the use of the respirator to ensure that it is used properly. The respirator must fit properly when a risk assessment indicates that it is necessary to use. Respiratory protection should be used in the workplace, and personal protective equipment should be selected to fit properly.

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.

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: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Environmental exposure controls: 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: pUC 18 DNA Control Plasmid Liquid.
XL10-Gold Liquid.
2-Mercaptoethanol Liquid.
ArcticExpress (DE3)RIL competent cells Liquid.

Colour: pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol Not available.
ArcticExpress (DE3)RIL competent cells Not available.

Odour: pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol Not available.
ArcticExpress (DE3)RIL competent cells Not available.

Odour threshold: pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol Not available.
ArcticExpress (DE3)RIL competent cells Not available.

pH: pUC 18 DNA Control Plasmid 7.5
XL10-Gold Not available.
2-Mercaptoethanol Not available.
ArcticExpress (DE3)RIL competent cells 6.4

Date of issue/Date of revision: 14/10/2016
### SECTION 9: Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold 2-Mercaptoethanol</th>
<th>ArcticExpress (DE3)RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/freezing point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapour pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapour density</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative density</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Not available.

**Date of issue/Date of revision:** 14/10/2016
### SECTION 9: Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
<th>ArcticExpress (DE3)RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive properties</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

9.2 Other information

No additional information.

### SECTION 10: Stability and reactivity

<table>
<thead>
<tr>
<th>10.1 Reactivity</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
<th>ArcticExpress (DE3)RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10.2 Chemical stability</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
<th>ArcticExpress (DE3)RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>The product is stable.</td>
<td>The product is stable.</td>
<td>The product is stable.</td>
<td>The product is stable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10.3 Possibility of hazardous reactions</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
<th>ArcticExpress (DE3)RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous reactions</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
<td></td>
</tr>
</tbody>
</table>

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SECTION 10: Stability and reactivity

10.4 Conditions to avoid

- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No specific data.

10.5 Incompatible materials

- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

May react or be incompatible with oxidising materials.

10.6 Hazardous decomposition products

- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

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>XL10-Gold</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>3000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>200 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>244 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>5545.5 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>4545.5 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapours)</td>
<td>45.45 mg/l</td>
</tr>
</tbody>
</table>

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>XL10-Gold</td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>10 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>Eyes - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>2 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>XL10-Gold 2-Mercaptoethanol</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>
**SECTION 11: Toxicological information**

**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

**Information on likely routes of exposure**

- **Inhalation**: pUC 18 DNA Control Plasmid
  - Routes of entry anticipated: Oral, Dermal, Inhalation.

- **Ingestion**: pUC 18 DNA Control Plasmid
  - Routes of entry anticipated: Oral, Dermal, Inhalation.

- **Skin contact**: pUC 18 DNA Control Plasmid
  - Routes of entry anticipated: Oral, Dermal, Inhalation.

**Potential acute health effects**

- **Inhalation**:
  - pUC 18 DNA Control Plasmid: No known significant effects or critical hazards.
  - XL10-Gold: No known significant effects or critical hazards.
  - 2-Mercaptoethanol: No known significant effects or critical hazards.
  - ArcticExpress (DE3)RIL competent cells: No known significant effects or critical hazards.

- **Ingestion**:
  - pUC 18 DNA Control Plasmid: No known significant effects or critical hazards.
  - XL10-Gold: No known significant effects or critical hazards.
  - 2-Mercaptoethanol: No known significant effects or critical hazards.
  - ArcticExpress (DE3)RIL competent cells: No known significant effects or critical hazards.

- **Skin contact**:
  - pUC 18 DNA Control Plasmid: No known significant effects or critical hazards.
  - XL10-Gold: May cause an allergic skin reaction.
  - 2-Mercaptoethanol: No known significant effects or critical hazards.
  - ArcticExpress (DE3)RIL competent cells: No known significant effects or critical hazards.

- **Eye contact**:
  - pUC 18 DNA Control Plasmid: No known significant effects or critical hazards.
  - XL10-Gold: Causes serious eye damage.
  - 2-Mercaptoethanol: No known significant effects or critical hazards.
  - ArcticExpress (DE3)RIL competent cells: No known significant effects or critical hazards.

**Symptoms related to the physical, chemical and toxicological characteristics**

- **Inhalation**:
  - pUC 18 DNA Control Plasmid: No specific data.
  - XL10-Gold: No specific data.
  - 2-Mercaptoethanol: No specific data.
  - ArcticExpress (DE3)RIL competent cells: No specific data.

- **Ingestion**:
  - pUC 18 DNA Control Plasmid: Adverse symptoms may include the following:
  - XL10-Gold: stomach pains
  - 2-Mercaptoethanol: No specific data.
  - ArcticExpress (DE3)RIL competent cells: No specific data.

- **Skin contact**:
  - pUC 18 DNA Control Plasmid: Adverse symptoms may include the following:
  - XL10-Gold: pain or irritation
  - 2-Mercaptoethanol: redness
  - ArcticExpress (DE3)RIL competent cells: blistering may occur
  - No specific data.

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SECTION 11: Toxicological information

**Eye contact**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

Adverse symptoms may include the following:
- pain
- watering
- redness

No specific data.

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

**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**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

No known significant effects or critical hazards.

**Carcinogenicity**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Mutagenicity**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Teratogenicity**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Developmental effects**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Fertility effects**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Eye contact**
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol
- ArcticExpress (DE3)RIL competent cells

No specific data.

Adverse symptoms may include the following:
- pain
- watering
- redness

No specific data.

**Date of issue/Date of revision**: 14/10/2016
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>XL10-Gold 2-Mercaptoethanol</td>
<td>Acute EC50 2430000 μg/l Fresh water</td>
<td>Algae - Navicula seminulum</td>
<td>96 hours</td>
</tr>
<tr>
<td>2-Mercaptoethanol Sodium chloride</td>
<td>Acute EC50 519.6 mg/l Fresh water</td>
<td>Crustaceans - Cypris subglobosa</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 6.87 g/L Fresh water</td>
<td>Aquatic plants - Lemna minor</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1661 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1000000 μg/l Fresh water</td>
<td>Fish - Morone saxatilis - Larvae</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic LC10 781 mg/l Fresh water</td>
<td>Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)</td>
<td>3 weeks</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 6 g/L Fresh water</td>
<td>Aquatic plants - Lemna minor</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.314 g/L Fresh water</td>
<td>Daphnia - Daphnia pulex</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 100 mg/l Fresh water</td>
<td>Fish - Gambusia holbrooki - Adult</td>
<td>8 weeks</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP ow</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>-0.056</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.4 Mobility in soil

<table>
<thead>
<tr>
<th>Soil/water partition coefficient (K ow)</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>:</td>
<td>:</td>
</tr>
</tbody>
</table>

12.5 Results of PBT and vPvB assessment

<table>
<thead>
<tr>
<th>PBT</th>
<th>vPvB</th>
</tr>
</thead>
<tbody>
<tr>
<td>:</td>
<td>:</td>
</tr>
</tbody>
</table>

12.6 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

<table>
<thead>
<tr>
<th>Product</th>
<th>Methods of disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>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.</td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>The classification of the product may meet the criteria for a hazardous waste.</td>
</tr>
<tr>
<td>Packaging</td>
<td>The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.</td>
</tr>
</tbody>
</table>

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SECTION 13: Disposal considerations

Special precautions: This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

Regulatory information

ADR/RID / IMDG / IATA: Not regulated.

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.

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

Annex XIV

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

pUC 18 DNA Control Plasmid: Not applicable.
XL10-Gold: Not applicable.
2-Mercaptoethanol: Not applicable.
ArcticExpress (DE3)RIL competent cells: Not applicable.

Other EU regulations

Europe inventory: All components are listed or exempted.

Industrial emissions (integrated pollution prevention and control) - Air

Ozone depleting substances (1005/2009/EU)

Not listed.

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

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

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

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

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SECTION 15: Regulatory information

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 : Not determined.
Japan : Japan inventory (ENCS): Not determined.
        Japan inventory (ISHL): Not determined.
Malaysia : Not determined.
New Zealand : Not determined.
Philippines : Not determined.
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>XL10-Gold 2-Mercaptoethanol</td>
<td></td>
</tr>
<tr>
<td>Eye Dam. 1, H318</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Skin Sens. 1, H317</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Chronic 3, H412</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

Full text of abbreviated H statements

<table>
<thead>
<tr>
<th>XL10-Gold 2-Mercaptoethanol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H301</td>
<td>Toxic if swallowed.</td>
</tr>
<tr>
<td>H310</td>
<td>Fatal in contact with skin.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H317</td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
<tr>
<td>H411</td>
<td>Toxic to aquatic life with long lasting effects.</td>
</tr>
<tr>
<td>H412</td>
<td>Harmful to aquatic life with long lasting effects.</td>
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</tbody>
</table>

Full text of classifications [CLP/GHS]

Date of issue/Date of revision : 14/10/2016
SECTION 16: Other information

<table>
<thead>
<tr>
<th>Substance</th>
<th>Classifications</th>
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<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>ACUTE TOXICITY (dermal) - Category 2</td>
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<tr>
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<td>ACUTE TOXICITY (inhalation) - Category 2</td>
</tr>
<tr>
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<td>ACUTE TOXICITY (oral) - Category 3</td>
</tr>
<tr>
<td></td>
<td>LONG-TERM AQUATIC HAZARD - Category 2</td>
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<tr>
<td></td>
<td>LONG-TERM AQUATIC HAZARD - Category 3</td>
</tr>
<tr>
<td></td>
<td>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1</td>
</tr>
<tr>
<td></td>
<td>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2</td>
</tr>
<tr>
<td></td>
<td>SKIN CORROSION/IRRITATION - Category 2</td>
</tr>
<tr>
<td></td>
<td>SKIN SENSITISATION - Category 1</td>
</tr>
<tr>
<td></td>
<td>SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE</td>
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<td>(Respiratory tract irritation) - Category 3</td>
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</tbody>
</table>

Date of issue/ Date of revision: 14/10/2016
Date of previous issue: No previous validation.
Version: 1

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