

# SAFETY DATA SHEET



BL21 Competent Cells, Part Number 200133

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

### 1.1 Product identifier

**Product name** : BL21 Competent Cells, Part Number 200133  
**Part No. (Kit)** : 200133  
**Part No.** : BL21 competent cells 200133-41  
pUC 18 DNA Control 200231-42  
Plasmid  
Beta Mercaptoethanol 210200-43

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

| Identified uses   |                         |
|---|-------------------------|
| Analytical reagent.<br>For Research Use Only. Not for use in diagnostic procedures. |                         |
| BL21 competent cells  | 5 x 0.2 ml              |
| pUC18 control plasmid   | 0.01 ml (0.1 ng/μl)     |
| 1.42 M 2-Mercaptoethanol  | 0.025 ml (25 μl 1.42 M) |

### 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** : BL21 competent cells Mixture  
pUC 18 DNA Control Mixture  
Plasmid  
Beta Mercaptoethanol Mixture

#### Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

##### Beta Mercaptoethanol

H312 ACUTE TOXICITY (dermal) - Category 4  
H332 ACUTE TOXICITY (inhalation) - Category 4  
H315 SKIN CORROSION/IRRITATION - Category 2  
H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1  
H317 SKIN SENSITISATION - Category 1  
H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

**BL21 Competent Cells, Part Number 200133**

**SECTION 2: Hazards identification**

**Ingredients of unknown toxicity** : BL21 competent cells Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%  
 Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%

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** : Beta Mercaptoethanol



**Signal word** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

No signal word.  
 No signal word.

Danger

**Hazard statements** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

No known significant effects or critical hazards.  
 No known significant effects or critical hazards.

H312 + H332 - Harmful in contact with skin or if inhaled.  
 H318 - Causes serious eye damage.  
 H315 - Causes skin irritation.  
 H317 - May cause an allergic skin reaction.  
 H412 - Harmful to aquatic life with long lasting effects.

**Precautionary statements**

**Prevention** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

Not applicable.  
 Not applicable.

P280 - Wear protective gloves. Wear protective clothing.  
 Wear eye or face protection.  
 P273 - Avoid release to the environment.

**Response** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

Not applicable.  
 Not applicable.

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
 P305 + P310 - IF IN EYES: Immediately call a POISON CENTER or physician.

**Storage** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

Not applicable.  
 Not applicable.

Not applicable.

**Disposal** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

Not applicable.  
 Not applicable.

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Hazardous ingredients** : Beta Mercaptoethanol

- 2-Mercaptoethanol

**Supplemental label elements** : BL21 competent cells  
 pUC 18 DNA Control  
 Plasmid  
 Beta Mercaptoethanol

Not applicable.  
 Not applicable.

Not applicable.

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## SECTION 2: Hazards identification

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : BL21 competent cells Not applicable.  
 pUC 18 DNA Control Not applicable.  
 Plasmid  
 Beta Mercaptoethanol Not applicable.

### Special packaging requirements

**Tactile warning of danger** : BL21 competent cells Not applicable.  
 pUC 18 DNA Control Not applicable.  
 Plasmid  
 Beta Mercaptoethanol Not applicable.

### 2.3 Other hazards

**Other hazards which do not result in classification** : BL21 competent cells None known.  
 pUC 18 DNA Control None known.  
 Plasmid  
 Beta Mercaptoethanol None known.

## SECTION 3: Composition/information on ingredients

**3.1 Substances** : BL21 competent cells Mixture  
 pUC 18 DNA Control Plasmid Mixture  
 Beta Mercaptoethanol Mixture

| Product/ingredient name                          | Identifiers  | %         | Regulation (EC) No. 1272/2008 [CLP]  | Type |
|--|--|-----------|--|------|
| <b>BL21 competent cells</b><br>Glycerol          | REACH #: Annex V<br>EC: 200-289-5<br>CAS: 56-81-5  | ≥10 - ≤25 | Not classified.  | [2]  |
| Sucrose  | REACH #: Annex IV<br>EC: 200-334-9<br>CAS: 57-50-1 | ≤10       | Not classified.  | [2]  |
| <b>Beta Mercaptoethanol</b><br>2-Mercaptoethanol | EC: 200-464-6<br>CAS: 60-24-2                      | ≤12       | Acute Tox. 3, H301<br>Acute Tox. 2, H310<br>Acute Tox. 2, H330<br>Skin Irrit. 2, H315<br>Eye Dam. 1, H318<br>Skin Sens. 1, H317<br>STOT SE 3, H335<br>Aquatic Chronic 2, H411<br><br><b>See Section 16 for the full text of the H statements declared above.</b> | [1]  |

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
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern
- [6] Additional disclosure due to company policy

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

|                     |                            |   |
|---------------------|----------------------------|---|
| <b>Eye contact</b>  | : BL21 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.   |
|                     | 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.   |
|                     | Beta 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.  |
| <b>Inhalation</b>   | : BL21 competent cells     | Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.   |
|                     | 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.   |
|                     | Beta 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. |
| <b>Skin contact</b> | : BL21 competent cells     | Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.  |
|                     | pUC 18 DNA Control Plasmid | Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.  |
|                     | Beta 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.  |
| <b>Ingestion</b>    | : BL21 competent cells     | 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.   |
|                     | 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.   |
|                     | Beta Mercaptoethanol       | Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if   |

## SECTION 4: First aid measures

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 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.

**Protection of first-aiders** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No action shall be taken involving any personal risk or without suitable training.  
No action shall be taken involving any personal risk or without suitable training.  
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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

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

#### Potential acute health effects

**Eye contact** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
Causes serious eye damage.

**Inhalation** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
Harmful if inhaled.

**Skin contact** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

**Ingestion** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.  
No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

**Eye contact** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No specific data.  
No specific data.  
Adverse symptoms may include the following:  
pain  
watering  
redness

**Inhalation** : BL21 competent cells  
pUC 18 DNA Control Plasmid  
Beta Mercaptoethanol

No specific data.  
No specific data.  
No specific data.

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**SECTION 4: First aid measures**

|                     |   |  |
|---------------------|---|--|
| <b>Skin contact</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No specific data.<br>No specific data.<br>Adverse symptoms may include the following:<br>pain or irritation<br>redness<br>blistering may occur |
| <b>Ingestion</b>    | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No specific data.<br>No specific data.<br>Adverse symptoms may include the following:<br>stomach pains   |

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

|                            |   |   |
|----------------------------|---|---|
| <b>Notes to physician</b>  | : BL21 competent cells<br><br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.<br>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.<br>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. |
| <b>Specific treatments</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | No specific treatment.<br>No specific treatment.<br>No specific treatment.  |

**SECTION 5: Firefighting measures**

**5.1 Extinguishing media**

|                                       |   |   |
|---------------------------------------|---|---|
| <b>Suitable extinguishing media</b>   | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Use an extinguishing agent suitable for the surrounding fire.<br>Use an extinguishing agent suitable for the surrounding fire.<br>Use an extinguishing agent suitable for the surrounding fire. |
| <b>Unsuitable extinguishing media</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | None known.<br>None known.<br>None known.   |

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

|  |   |   |
|--|---|---|
| <b>Hazards from the substance or mixture</b> | : BL21 competent cells<br><br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | In a fire or if heated, a pressure increase will occur and the container may burst.<br>In a fire or if heated, a pressure increase will occur and the container may burst.<br>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. |
| <b>Hazardous combustion products</b>         | : BL21 competent cells<br><br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>sulfur oxides<br>halogenated compounds<br>metal oxide/oxides<br>No specific data.<br>Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>sulfur oxides  |

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## SECTION 5: Firefighting measures

### 5.3 Advice for firefighters

|   |                            |   |
|---|----------------------------|---|
| <b>Special precautions for fire-fighters</b>          | : BL21 competent cells     | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.   |
|   | pUC 18 DNA Control Plasmid | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.   |
|   | Beta Mercaptoethanol       | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.   |
| <b>Special protective equipment for fire-fighters</b> | : BL21 competent cells     | 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. |
|   | pUC 18 DNA Control Plasmid | 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. |
|   | Beta Mercaptoethanol       | 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

|                                    |                            |  |
|------------------------------------|----------------------------|--|
| <b>For non-emergency personnel</b> | : BL21 competent cells     | 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.  |
|                                    | pUC 18 DNA Control Plasmid | 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.  |
|                                    | Beta Mercaptoethanol       | 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. |
| <b>For emergency responders</b>    | : BL21 competent cells     | 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".  |
|                                    | pUC 18 DNA Control Plasmid | 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".  |
|                                    | Beta Mercaptoethanol       | 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-   |

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## SECTION 6: Accidental release measures

emergency personnel".

### 6.2 Environmental precautions

|                            |  |
|----------------------------|--|
| : BL21 competent cells     | 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).  |
| pUC 18 DNA Control Plasmid | 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).  |
| Beta Mercaptoethanol       | 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. |

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

#### Methods for cleaning up

|                            |   |
|----------------------------|---|
| : BL21 competent cells     | 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. |
| pUC 18 DNA Control Plasmid | 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. |
| Beta Mercaptoethanol       | 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. |

### 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

|                            |   |
|----------------------------|---|
| : BL21 competent cells     | Put on appropriate personal protective equipment (see Section 8).   |
| pUC 18 DNA Control Plasmid | Put on appropriate personal protective equipment (see Section 8).   |
| Beta Mercaptoethanol       | Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. |



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**SECTION 7: Handling and storage**

|   |                            |   |
|---|----------------------------|---|
| <b>Advice on general occupational hygiene</b> | : BL21 competent cells     | Potentially biohazardous material. 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. |
|   | pUC 18 DNA Control Plasmid | 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.   |
|   | Beta Mercaptoethanol       | 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**

|                |                            |  |
|----------------|----------------------------|--|
| <b>Storage</b> | : BL21 competent cells     | 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. See Section 10 for incompatible materials before handling or use.                  |
|                | pUC 18 DNA Control Plasmid | 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. See Section 10 for incompatible materials before handling or use.                  |
|                | Beta Mercaptoethanol       | 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. Store locked up. 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. See Section 10 for incompatible materials before handling or use. |

**7.3 Specific end use(s)**

|                        |                            |   |
|------------------------|----------------------------|---|
| <b>Recommendations</b> | : BL21 competent cells     | Industrial applications, Professional applications. |
|                        | pUC 18 DNA Control Plasmid | Industrial applications, Professional applications. |
|                        | Beta Mercaptoethanol       | Industrial applications, Professional applications. |

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## SECTION 7: Handling and storage

|   |                               |                 |
|---|-------------------------------|-----------------|
| <b>Industrial sector specific solutions</b> | <b>:</b> BL21 competent cells | Not applicable. |
|   | pUC 18 DNA Control            | Not applicable. |
|   | Plasmid                       |                 |
|   | Beta Mercaptoethanol          | Not applicable. |

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

| Product/ingredient name     | Exposure limit values   |
|-----------------------------|---|
| <b>BL21 competent cells</b> | <b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b><br>TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Mist                                |
| Glycerol                    |   |
| Sucrose                     | <b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b><br>STEL: 20 mg/m <sup>3</sup> 15 minutes.<br>TWA: 10 mg/m <sup>3</sup> 8 hours. |

**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.

**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

## SECTION 8: Exposure controls/personal 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.
- 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

|  |   |  |
|--|---|--|
| <b>Physical state</b>                          | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Liquid.<br>Liquid.<br><br>Liquid.                      |
| <b>Colour</b>                                  | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Not available.<br>Not available.<br><br>Not available. |
| <b>Odour</b>                                   | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Not available.<br>Not available.<br><br>Not available. |
| <b>Odour threshold</b>                         | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Not available.<br>Not available.<br><br>Not available. |
| <b>pH</b>                                      | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | 6.4<br>7.5<br><br>Not available.                       |
| <b>Melting point/freezing point</b>            | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Not available.<br>0°C<br><br>Not available.            |
| <b>Initial boiling point and boiling range</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Not available.<br>100°C<br><br>Not available.          |
| <b>Flash point</b>                             | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Not available.<br>Not available.<br><br>Not available. |

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## SECTION 9: Physical and chemical properties

|   |   |   |
|---|---|---|
| <b>Evaporation rate</b>                             | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Flammability (solid, gas)</b>                    | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not applicable.<br>Not applicable.<br>Not applicable.   |
| <b>Upper/lower flammability or explosive limits</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Vapour pressure</b>                              | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Vapour density</b>                               | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Relative density</b>                             | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Solubility(ies)</b>                              | : BL21 competent cells<br><br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | Soluble in the following materials: cold water and hot water.<br>Easily soluble in the following materials: cold water and hot water.<br>Easily soluble in the following materials: cold water and hot water. |
| <b>Partition coefficient: n-octanol/water</b>       | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Auto-ignition temperature</b>                    | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Decomposition temperature</b>                    | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Viscosity</b>                                    | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Explosive properties</b>                         | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |
| <b>Oxidising properties</b>                         | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol     | Not available.<br>Not available.<br>Not available.  |

### 9.2 Other information

No additional information.

## SECTION 10: Stability and reactivity

|  |  |  |
|--|--|--|
| <b>10.1 Reactivity</b>                         | : BL21 competent cells<br><br>pUC 18 DNA Control Plasmid<br>Beta Mercaptoethanol | No specific test data related to reactivity available for this product or its ingredients.<br>No specific test data related to reactivity available for this product or its ingredients.<br>No specific test data related to reactivity available for this product or its ingredients.                               |
| <b>10.2 Chemical stability</b>                 | : BL21 competent cells<br>pUC 18 DNA Control Plasmid<br>Beta Mercaptoethanol     | The product is stable.<br>The product is stable.<br>The product is stable.   |
| <b>10.3 Possibility of hazardous reactions</b> | : BL21 competent cells<br><br>pUC 18 DNA Control Plasmid<br>Beta Mercaptoethanol | Under normal conditions of storage and use, hazardous reactions will not occur.<br>Under normal conditions of storage and use, hazardous reactions will not occur.<br>Under normal conditions of storage and use, hazardous reactions will not occur.  |
| <b>10.4 Conditions to avoid</b>                | : BL21 competent cells<br>pUC 18 DNA Control Plasmid<br>Beta Mercaptoethanol     | No specific data.<br>No specific data.<br>No specific data.  |
| <b>10.5 Incompatible materials</b>             | : BL21 competent cells<br>pUC 18 DNA Control Plasmid<br>Beta Mercaptoethanol     | May react or be incompatible with oxidising materials.<br>May react or be incompatible with oxidising materials.<br>May react or be incompatible with oxidising materials.   |
| <b>10.6 Hazardous decomposition products</b>   | : BL21 competent cells<br><br>pUC 18 DNA Control Plasmid<br>Beta Mercaptoethanol | Under normal conditions of storage and use, hazardous decomposition products should not be produced.<br>Under normal conditions of storage and use, hazardous decomposition products should not be produced.<br>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

| Product/ingredient name                          | Result      | Species | Dose      | Exposure |
|--|-------------|---------|-----------|----------|
| <b>Beta Mercaptoethanol</b><br>2-Mercaptoethanol | LD50 Dermal | Rabbit  | 200 mg/kg | -        |
|  | LD50 Oral   | Rat     | 244 mg/kg | -        |

#### Acute toxicity estimates

| Route   | ATE value                           |
|---|-------------------------------------|
| <b>BL21 competent cells</b><br>Oral                                   | 33062.5 mg/kg                       |
| <b>Beta Mercaptoethanol</b><br>Oral<br>Dermal<br>Inhalation (vapours) | 2440 mg/kg<br>2000 mg/kg<br>20 mg/l |

#### Irritation/Corrosion

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| Product/ingredient name                   | Result                 | Species | Score | Exposure     | Observation |
|---|------------------------|---------|-------|--------------|-------------|
| Beta Mercaptoethanol<br>2-Mercaptoethanol | Eyes - Severe irritant | Rabbit  | -     | 2 milligrams | -           |

### Sensitiser

Conclusion/Summary : Not available.

### Specific target organ toxicity (single exposure)

| Product/ingredient name                   | Category   | Route of exposure | Target organs                |
|---|------------|-------------------|------------------------------|
| Beta Mercaptoethanol<br>2-Mercaptoethanol | Category 3 | Not applicable.   | Respiratory tract irritation |

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

### Information on likely routes of exposure

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

Routes of entry anticipated: Oral, Dermal, Inhalation.  
Not available.

Routes of entry anticipated: Oral, Dermal, Inhalation.

### Potential acute health effects

#### Inhalation

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.

Harmful if inhaled.

#### Ingestion

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.

#### Skin contact

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.

Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

#### Eye contact

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

No known significant effects or critical hazards.  
No known significant effects or critical hazards.

Causes serious eye damage.

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

#### Inhalation

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

No specific data.  
No specific data.

No specific data.

#### Ingestion

: BL21 competent cells  
pUC 18 DNA Control  
Plasmid  
Beta Mercaptoethanol

No specific data.  
No specific data.

Adverse symptoms may include the following:  
stomach pains

## SECTION 11: Toxicological information

|                     |   |  |
|---------------------|---|--|
| <b>Skin contact</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No specific data.<br>No specific data.<br>Adverse symptoms may include the following:<br>pain or irritation<br>redness<br>blistering may occur |
| <b>Eye contact</b>  | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No specific data.<br>No specific data.<br>Adverse symptoms may include the following:<br>pain<br>watering<br>redness                           |

### 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

|                              |   |   |
|------------------------------|---|---|
| <b>General</b>               | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. |
| <b>Carcinogenicity</b>       | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.   |
| <b>Mutagenicity</b>          | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.   |
| <b>Teratogenicity</b>        | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.   |
| <b>Developmental effects</b> | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.   |
| <b>Fertility effects</b>     | : BL21 competent cells<br>pUC 18 DNA Control<br>Plasmid<br>Beta Mercaptoethanol | No known significant effects or critical hazards.<br>No known significant effects or critical hazards.<br>No known significant effects or critical hazards.   |

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## SECTION 12: Ecological information

### 12.1 Toxicity

Conclusion/Summary : Not available.

### 12.2 Persistence and degradability

Not available.

### 12.3 Bioaccumulative potential

| Product/ingredient name                   | LogP <sub>ow</sub> | BCF | Potential |
|---|--------------------|-----|-----------|
| Beta Mercaptoethanol<br>2-Mercaptoethanol | -0.056             | -   | low       |

### 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.

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

#### Packaging

Methods of disposal : 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.

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 spilled material and runoff and contact with soil, waterways, drains and sewers.

## SECTION 14: Transport 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.

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## 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** : BL21 competent cells Not applicable.  
pUC 18 DNA Control Plasmid Not applicable.  
Beta Mercaptoethanol Not applicable.

#### Other EU regulations

**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 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)

Not listed.

##### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

#### Inventory list

**Australia** : All components are listed or exempted.  
**Canada** : All components are listed or exempted.  
**China** : Not determined.  
**Europe** : All components are listed or exempted.  
**Japan** : **Japan inventory (ENCS)**: Not determined.  
**Japan inventory (ISHL)**: All components are listed or exempted.  
**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.

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## SECTION 15: Regulatory information

|                      |  |
|----------------------|--|
| <b>Thailand</b>      | : Not determined.                        |
| <b>Turkey</b>        | : Not determined.                        |
| <b>United States</b> | : All components are listed or exempted. |
| <b>Viet Nam</b>      | : Not determined.                        |

**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]

| Classification  | Justification  |
|---|--|
| <b>Beta Mercaptoethanol</b><br>Acute Tox. 4, H312<br>Acute Tox. 4, H332<br>Skin Irrit. 2, H315<br>Eye Dam. 1, H318<br>Skin Sens. 1, H317<br>Aquatic Chronic 3, H412 | Calculation method<br>Calculation method<br>Calculation method<br>Calculation method<br>Calculation method<br>Calculation method |

### Full text of abbreviated H statements

|   |   |
|---|---|
| <b>Beta Mercaptoethanol</b><br>H301<br>H310<br>H312<br>H315<br>H317<br>H318<br>H330<br>H332<br>H335<br>H411<br>H412 | Toxic if swallowed.<br>Fatal in contact with skin.<br>Harmful in contact with skin.<br>Causes skin irritation.<br>May cause an allergic skin reaction.<br>Causes serious eye damage.<br>Fatal if inhaled.<br>Harmful if inhaled.<br>May cause respiratory irritation.<br>Toxic to aquatic life with long lasting effects.<br>Harmful to aquatic life with long lasting effects. |
|---|---|

### Full text of classifications [CLP/GHS]

|   |   |
|---|---|
| <b>Beta Mercaptoethanol</b><br>Acute Tox. 2, H310<br>Acute Tox. 2, H330<br>Acute Tox. 3, H301<br>Acute Tox. 4, H312<br>Acute Tox. 4, H332<br>Aquatic Chronic 2, H411<br>Aquatic Chronic 3, H412<br>Eye Dam. 1, H318<br>Skin Irrit. 2, H315<br>Skin Sens. 1, H317<br>STOT SE 3, H335 | ACUTE TOXICITY (dermal) - Category 2<br>ACUTE TOXICITY (inhalation) - Category 2<br>ACUTE TOXICITY (oral) - Category 3<br>ACUTE TOXICITY (dermal) - Category 4<br>ACUTE TOXICITY (inhalation) - Category 4<br>LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2<br>LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3<br>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1<br>SKIN CORROSION/IRRITATION - Category 2<br>SKIN SENSITISATION - Category 1<br>SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3 |
|---|---|

**Date of issue/ Date of revision** : 30/10/2017

**Date of issue/Date of revision** : 30/10/2017

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## **SECTION 16: Other information**

**Date of previous issue** : No previous validation.

**Version** : 1

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