SAFETY DATA SHEET
PfuUltra II Fusion HS DNA Polymerase, Part Number 600672

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

1.1 Product identifier
Product name: PfuUltra II Fusion HS DNA Polymerase, Part Number 600672
Part no. (chemical kit): 600672
Part no.: PfuUltra II Fusion HS DNA Polymerase 600672-51
10X PfuUltra II Reaction Buffer 600670-52

1.2 Relevant identified uses of the substance or mixture and uses advised against
Material uses:
- Analytical reagent.
- PfuUltra II Fusion HS DNA Polymerase 0.2 ml (200 reactions)
- 10X PfuUltra II Reaction Buffer 2 x 1 ml

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:
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]
Not classified.

Ingredients of unknown toxicity:
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 30 - 60%
Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10%
Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%
Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 1 - 10%

Ingredients of unknown ecotoxicity:
- 10X PfuUltra II Reaction Buffer

Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 3.4%

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.

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SECTION 2: Hazards identification

2.2 Label elements

<table>
<thead>
<tr>
<th>Signal word</th>
<th>PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer</th>
<th>No signal word.</th>
</tr>
</thead>
</table>

**Hazard statements**

- **PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer**: No known significant effects or critical hazards.

**Precautionary statements**

- **Prevention**: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Not applicable.
- **Response**: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Not applicable.
- **Storage**: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Not applicable.
- **Disposal**: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Not applicable.

**Hazardous ingredients**

- 10X PfuUltra II Reaction Buffer. Not applicable.

**Supplemental label elements**

- PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Safety data sheet available on request.

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

- PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Not applicable.

**Special packaging requirements**

- PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. Not applicable.

2.3 Other hazards

- **Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII**

  - PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer. This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

PfuUltra II Fusion HS DNA Polymerase, Part Number 600672

SECTION 2: Hazards identification

Other hazards which do not result in classification:

- PfuUltra II Fusion HS DNA Polymerase: None known.
- 10X PfuUltra II Reaction Buffer: None known.

SECTION 3: Composition/information on ingredients

3.1 Substances:

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Identifiers</th>
<th>%</th>
<th>Regulation (EC) No. 1272/2008 [CLP]</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuUltra II Fusion HS DNA Polymerase</td>
<td>REACH #: Annex V</td>
<td>≥50 - ≤75</td>
<td>Not classified.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>EC: 200-289-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAS: 56-81-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td>Trometamol</td>
<td>≤3</td>
<td>Skin Irrit. 2, H315</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>EC: 201-064-4</td>
<td></td>
<td>Eye Irrit. 2, H319</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAS: 77-86-1</td>
<td></td>
<td>STOT SE 3, H335</td>
<td></td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>EC: 231-984-1</td>
<td>≤2.2</td>
<td>Aquatic Acute 1, H400 (M=10)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CAS: 7783-20-2</td>
<td></td>
<td>Aquatic Chronic 3, H412</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAS: 9002-93-1</td>
<td></td>
<td>Acute Tox. 4, H302</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skin Irrit. 2, H315</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2, H319</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic 2, H411</td>
<td></td>
</tr>
</tbody>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment 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

Eye contact:

- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

Inhalation:

- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

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**SECTION 4: First aid measures**

**Skin contact**
- **PfuUltra II Fusion HS DNA Polymerase**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- **10X PfuUltra II Reaction Buffer**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

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.

**Ingestion**
- **PfuUltra II Fusion HS DNA Polymerase**: 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.
- **10X PfuUltra II Reaction Buffer**: 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**
- **PfuUltra II Fusion HS DNA Polymerase**: No action shall be taken involving any personal risk or without suitable training.
- **10X PfuUltra II Reaction Buffer**: 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**

**Eye contact**
- **PfuUltra II Fusion HS DNA Polymerase**: No known significant effects or critical hazards.
- **10X PfuUltra II Reaction Buffer**: No known significant effects or critical hazards.

**Inhalation**
- **PfuUltra II Fusion HS DNA Polymerase**: No known significant effects or critical hazards.
- **10X PfuUltra II Reaction Buffer**: No known significant effects or critical hazards.

**Skin contact**
- **PfuUltra II Fusion HS DNA Polymerase**: No known significant effects or critical hazards.
- **10X PfuUltra II Reaction Buffer**: No known significant effects or critical hazards.

**Ingestion**
- **PfuUltra II Fusion HS DNA Polymerase**: No known significant effects or critical hazards.
- **10X PfuUltra II Reaction Buffer**: No known significant effects or critical hazards.

**Over-exposure signs/symptoms**

**Eye contact**
- **PfuUltra II Fusion HS DNA Polymerase**: No specific data.
- **10X PfuUltra II Reaction Buffer**: No specific data.

**Inhalation**
- **PfuUltra II Fusion HS DNA Polymerase**: No specific data.
- **10X PfuUltra II Reaction Buffer**: No specific data.

**Skin contact**
- **PfuUltra II Fusion HS DNA Polymerase**: No specific data.
- **10X PfuUltra II Reaction Buffer**: No specific data.

**Ingestion**
- **PfuUltra II Fusion HS DNA Polymerase**: No specific data.
- **10X PfuUltra II Reaction Buffer**: No specific data.

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SECTION 4: First aid measures

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

PfuUltra II Fusion HS DNA Polymerase
Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

10X PfuUltra II Reaction Buffer
In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments

PfuUltra II Fusion HS DNA Polymerase
No specific treatment.

10X PfuUltra II Reaction Buffer
No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

PfuUltra II Fusion HS DNA Polymerase
Use an extinguishing agent suitable for the surrounding fire.

10X PfuUltra II Reaction Buffer
Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media

PfuUltra II Fusion HS DNA Polymerase
None known.

10X PfuUltra II Reaction Buffer
None known.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products

PfuUltra II Fusion HS DNA Polymerase
In a fire or if heated, a pressure increase will occur and the container may burst.

10X PfuUltra II Reaction Buffer
In a fire or if heated, a pressure increase will occur and the container may burst.

Decomposition products may include the following materials:
- carbon dioxide
- carbon monoxide
- nitrogen oxides
- sulfur oxides
- metal oxide/oxides

5.3 Advice for firefighters

Special precautions for fire-fighters

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. 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.

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.

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 5: Firefighting measures

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>For emergency responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>For non-emergency personnel</td>
<td>For emergency responders</td>
</tr>
</tbody>
</table>

| PfuUltra II Fusion HS DNA Polymerase | 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. |
| 10X PfuUltra II Reaction Buffer | 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. |

| PfuUltra II Fusion HS DNA Polymerase | 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". |
| 10X PfuUltra II Reaction Buffer | If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". |

#### 6.2 Environmental precautions

| PfuUltra II Fusion HS DNA Polymerase | 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). |
| 10X PfuUltra II Reaction Buffer | 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). |

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

<table>
<thead>
<tr>
<th>Methods for cleaning up</th>
<th>PfuUltra II Fusion HS DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<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>
<td></td>
</tr>
<tr>
<td>10X PfuUltra II Reaction Buffer</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

<table>
<thead>
<tr>
<th>Protective measures</th>
<th>PfuUltra II Fusion HS DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Put on appropriate personal protective equipment (see Section 8).</td>
<td></td>
</tr>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td>Put on appropriate personal protective equipment (see Section 8).</td>
</tr>
</tbody>
</table>

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SECTION 7: Handling and storage

Advice on general occupational hygiene:

**PfuUltra II Fusion HS DNA Polymerase**

- 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.

**10X PfuUltra II Reaction Buffer**

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

7.2 Conditions for safe storage, including any incompatibilities

**Storage**

**PfuUltra II Fusion HS DNA Polymerase**

- 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.

**10X PfuUltra II Reaction Buffer**

- 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.

7.3 Specific end use(s)

**Recommendations**

**PfuUltra II Fusion HS DNA Polymerase**

- Industrial applications, Professional applications.

**10X PfuUltra II Reaction Buffer**

- Industrial applications, Professional applications.

**Industrial sector specific solutions**

**PfuUltra II Fusion HS DNA Polymerase**

- Not applicable.

**10X PfuUltra II Reaction Buffer**

- Not applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

**Occupational exposure limits**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Exposure limit values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PfuUltra II Fusion HS DNA Polymerase</strong></td>
<td>EH40/2005 WELs (United Kingdom (UK), 8/2018).</td>
</tr>
<tr>
<td>Glycerol</td>
<td>TWA: 10 mg/m³ 8 hours. Form: Mist</td>
</tr>
</tbody>
</table>

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SECTION 8: Exposure controls/personal protection

**Recommended monitoring procedures**

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

### DNELs/DMELs

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Type</th>
<th>Exposure</th>
<th>Value</th>
<th>Population</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X PfuUltra II Reaction Buffer, Trometamol</td>
<td>DNEL</td>
<td>Long term Oral</td>
<td>8.3 mg/kg bw/day</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Inhalation</td>
<td>29 mg/m³</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Dermal</td>
<td>83.3 mg/kg bw/day</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Inhalation</td>
<td>117.5 mg/m³</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Dermal</td>
<td>166.7 mg/kg bw/day</td>
<td>Workers</td>
<td>Systemic</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>DNEL</td>
<td>Long term Inhalation</td>
<td>1.667 mg/m³</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Oral</td>
<td>6.4 mg/kg bw/day</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Inhalation</td>
<td>11.167 mg/m³</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Dermal</td>
<td>12.8 mg/kg bw/day</td>
<td>General population</td>
<td>Systemic</td>
</tr>
<tr>
<td></td>
<td>DNEL</td>
<td>Long term Dermal</td>
<td>42.667 mg/kg bw/day</td>
<td>Workers</td>
<td>Systemic</td>
</tr>
</tbody>
</table>

### PNECs

No PNECs available

**8.2 Exposure controls**

**Appropriate engineering controls**

Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

**Individual protection measures**

**Hygiene measures**

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

**Eye/face protection**

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

**Skin protection**

**Hand protection**

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

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SECTION 8: Exposure controls/personal protection

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

<table>
<thead>
<tr>
<th>Property</th>
<th>PfuUltra II Fusion HS DNA Polymerase</th>
<th>10X PfuUltra II Reaction Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid.</td>
<td>Liquid.</td>
</tr>
<tr>
<td>Colour</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Odour</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>pH</td>
<td>PfuUltra II Fusion HS DNA Polymerase 8</td>
<td>10X PfuUltra II Reaction Buffer 10</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>10X PfuUltra II Reaction Buffer Not available.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>10X PfuUltra II Reaction Buffer Not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>10X PfuUltra II Reaction Buffer Not available.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>PfuUltra II Fusion HS DNA Polymerase Not available.</td>
<td>10X PfuUltra II Reaction Buffer Not available.</td>
</tr>
</tbody>
</table>

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SECTION 9: Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>PfuUltra II Fusion HS DNA Polymerase</th>
<th>10X PfuUltra II Reaction Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapour pressure</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Soluble in the following materials: cold water and hot water.</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

9.2 Other information
No additional information.

Date of issue/Date of revision: 23/07/2019
SECTION 10: Stability and reactivity

10.1 Reactivity: PfuUltra II Fusion HS DNA Polymerase
- No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability: PfuUltra II Fusion HS DNA Polymerase
- The product is stable.

10.3 Possibility of hazardous reactions: PfuUltra II Fusion HS DNA Polymerase
- Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid: PfuUltra II Fusion HS DNA Polymerase
- No specific data.

10.5 Incompatible materials: PfuUltra II Fusion HS DNA Polymerase
- May react or be incompatible with oxidising materials.

10.6 Hazardous decomposition products: PfuUltra II Fusion HS DNA Polymerase
- 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>10X PfuUltra II Reaction Buffer Trometamol</td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2840 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1800 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Oral (mg/kg)</th>
<th>Dermal (mg/kg)</th>
<th>Inhalation (gases) (ppm)</th>
<th>Inhalation (vapours) (mg/l)</th>
<th>Inhalation (dusts and mists) (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trometamol</td>
<td>180000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>5000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>2840</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

Date of issue/Date of revision: 23/07/2019

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SECTION 11: Toxicological information

<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>10X PfuUltra II Reaction Buffer</td>
<td>Skin - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>25 Percent</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours</td>
<td>-</td>
</tr>
</tbody>
</table>

Sensitiser

Conclusion/Summary: Not available.

Mutagenicity

Conclusion/Summary: Not available.

Carcinogenicity

Conclusion/Summary: Not available.

Reproductive toxicity

Conclusion/Summary: Not available.

Teratogenicity

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>10X PfuUltra II Reaction Buffer</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Trometamol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Routes of entry anticipated: Oral, Dermal, Inhalation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td></td>
</tr>
<tr>
<td>Trometamol</td>
<td></td>
</tr>
</tbody>
</table>

Potential acute health effects

Inhalation

: PfuUltra II Fusion HS DNA Polymerase

No known significant effects or critical hazards.

10X PfuUltra II Reaction Buffer

No known significant effects or critical hazards.

Ingestion

: PfuUltra II Fusion HS DNA Polymerase

No known significant effects or critical hazards.

10X PfuUltra II Reaction Buffer

No known significant effects or critical hazards.

Skin contact

: PfuUltra II Fusion HS DNA Polymerase

No known significant effects or critical hazards.

10X PfuUltra II Reaction Buffer

No known significant effects or critical hazards.

Eye contact

: PfuUltra II Fusion HS DNA Polymerase

No known significant effects or critical hazards.

10X PfuUltra II Reaction Buffer

No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Date of issue/Date of revision: 23/07/2019
### Toxicological information

#### SECTION 11: Toxicological information

<table>
<thead>
<tr>
<th>Type</th>
<th>Compound</th>
<th>No specific data.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inhalation</strong></td>
<td>PfuUltra II Fusion HS DNA Polymerase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10X PfuUltra II Reaction Buffer</td>
<td></td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>PfuUltra II Fusion HS DNA Polymerase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10X PfuUltra II Reaction Buffer</td>
<td></td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>PfuUltra II Fusion HS DNA Polymerase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10X PfuUltra II Reaction Buffer</td>
<td></td>
</tr>
<tr>
<td><strong>Eye contact</strong></td>
<td>PfuUltra II Fusion HS DNA Polymerase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10X PfuUltra II Reaction Buffer</td>
<td></td>
</tr>
</tbody>
</table>

**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**
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

**Carcinogenicity**
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

**Mutagenicity**
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

**Teratogenicity**
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

**Developmental effects**
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

**Fertility effects**
- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

**Metabolism**
- Not available.

---

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SECTION 11: Toxicological information

Elimination: Not available.

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>10X PfuUltra II Reaction Buffer</td>
<td>Acute EC50 &gt;980 mg/l Fresh water</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td>Trometamol</td>
<td>Acute NOEC 520 mg/l Fresh water</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>Acute LC50 2.6 mg/l Fresh water</td>
<td>Daphnia - Ceriodaphnia dubia - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 14000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 68 µg/l Fresh water</td>
<td>Fish - Oncorhynchus gorbuscha - Alevin</td>
<td>96 hours</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>Chronic NOEC 7.5 mg/l Marine water</td>
<td>Algae - Phaeodactylum tricornutum - Exponential growth phase</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 143 µg/l Marine water</td>
<td>Fish - Salmo salar - Post-smolt</td>
<td>5 weeks</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 5.85 mg/l Fresh water</td>
<td>Crustaceans - Ceriodaphnia rigaudii - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 11.2 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 4500 µg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability

Not available.

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

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>10X PfuUltra II Reaction Buffer</td>
<td>-1.56</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Trometamol</td>
<td>-5.1</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>4.86</td>
<td>-</td>
<td>high</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}): Not available.

Mobility: Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

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SECTION 12: Ecological information

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: Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 2008/98/EC.

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. 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

<table>
<thead>
<tr>
<th>ADR/RID</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2 UN proper shipping name</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.3 Transport hazard class(es)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.4 Packing group</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.5 Environmental hazards</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>

Additional information

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

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Intrinsic property</th>
<th>Status</th>
<th>Reference number</th>
<th>Date of revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td>Substance of equivalent concern for environment</td>
<td>Listed</td>
<td>42</td>
<td>7/3/2017</td>
</tr>
</tbody>
</table>

Substances of very high concern

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Intrinsic property</th>
<th>Status</th>
<th>Reference number</th>
<th>Date of revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X PfuUltra II Reaction Buffer</td>
<td>Substance of equivalent concern for human health</td>
<td>Recommended</td>
<td>ED/169/2012</td>
<td>2/10/2014</td>
</tr>
</tbody>
</table>

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

- PfuUltra II Fusion HS DNA Polymerase
- 10X PfuUltra II Reaction Buffer

Other EU regulations

- 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 : Not determined.
- Canada : Not determined.
- China : Not determined.
- Europe : All components are listed or exempted.

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PfuUltra II Fusion HS DNA Polymerase, Part Number 600672

SECTION 15: Regulatory information

15.2 Chemical safety assessment

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

Japan inventory (ENCS): Not determined.
Japan inventory (ISHL): Not determined.

New Zealand: Not determined.

Philippines: Not determined.

Republic of Korea: Not determined.

Taiwan: All components are listed or exempted.

Thailand: Not determined.

Turkey: Not determined.

United States: All components are listed or exempted.

Viet Nam: Not determined.

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]
- DMEL = Derived Minimal Effect Level
- DNEL = Derived No Effect Level
- EUH statement = CLP-specific Hazard statement
- N/A = Not available
- PBT = Persistent, Bioaccumulative and Toxic
- PNEC = Predicted No Effect Concentration
- RRN = REACH Registration Number
- vPvB = Very Persistent and Very Bioaccumulative

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>Not classified.</td>
<td></td>
</tr>
</tbody>
</table>

Full text of abbreviated H statements

10X PfuUltra II Reaction Buffer

H302
Harmful if swallowed.

H315
Causes skin irritation.

H319
Causes serious eye irritation.

H335
May cause respiratory irritation.

H400
Very toxic to aquatic life.

H411
Toxic to aquatic life with long lasting effects.

H412
Harmful to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

10X PfuUltra II Reaction Buffer

Acute Tox. 4, H302
ACUTE TOXICITY (oral) - Category 4

Aquatic Acute 1, H400
SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1

Aquatic Chronic 2, H411
LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2

Aquatic Chronic 3, H412
LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

Eye Irrit. 2, H319
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2

Skin Irrit. 2, H315
SKIN CORROSION/IRRITATION - Category 2

STOT SE 3, H335
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE
(Respiratory tract irritation) - Category 3

Date of issue/ Date of revision : 23/07/2019
Date of previous issue : 28/04/2017

Date of issue/ Date of revision : 23/07/2019
SECTION 16: Other information

Notice to reader

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