### Section 1. Identification

**Product identifier**: PfuTurbo Hotstart DNA Polymerase, Part Number 600322

**Part No. (Chemical Kit)**: 600322

**Part No.**: PfuTurbo Hotstart DNA polymerase 600322-51

10X Cloned Pfu Reaction Buffer 600153-82

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

Analytical reagent.

### Section 2. Hazard(s) identification

**Classification of the substance or mixture**

**10X Cloned Pfu Reaction Buffer**

**Signal word**: No signal word.

**Hazard statements**: No known significant effects or critical hazards.

**Precautionary statements**: H319 - Causes serious eye irritation.

**GHS label elements**

**Hazard pictograms**: 10X Cloned Pfu Reaction Buffer

**Date of issue/Date of revision**: 31/05/2017

**Date of previous issue**: 30/01/2015

**Version**: 4

---

**PfuTurbo Hotstart DNA polymerase**

**10X Cloned Pfu Reaction Buffer**

**Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity**: 30 - 60%

**Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity**: 1 - 10%

**Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity**: 1 - 10%

**Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment**: 3.2%
Section 2. Hazard(s) identification

**Prevention**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Prevention: Not applicable.

**Response**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Response: Not applicable.

**Storage**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Storage: Not applicable.

**Disposal**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Disposal: Not applicable.

**Supplemental label elements**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Supplemental label elements: Not applicable.

**Other hazards which do not result in classification**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Other hazards which do not result in classification: None known.

Section 3. Composition and ingredient information

**Substance/mixture**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Substance/mixture: Mixture

**CAS number/other identifiers**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>% (w/w)</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo Hotstart DNA polymerase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥30 - ≤60</td>
<td>56-81-5</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>≤2.3</td>
<td>9002-93-1</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.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

**Description of necessary first aid measures**

**Eye contact**

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Eye contact: 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.

- PfuTurbo Hotstart DNA polymerase
- 10X Cloned Pfu Reaction Buffer

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue
Section 4. First aid measures

Inhalation

PfuTurbo Hotstart DNA polymerase

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

10X Cloned Pfu Reaction Buffer

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

Skin contact

PfuTurbo Hotstart DNA polymerase

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

10X Cloned Pfu Reaction Buffer

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion

PfuTurbo Hotstart 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 Cloned Pfu Reaction Buffer

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. 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.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact

PfuTurbo Hotstart DNA polymerase

No known significant effects or critical hazards.

10X Cloned Pfu Reaction Buffer

Causes serious eye irritation.

Inhalation

PfuTurbo Hotstart DNA polymerase

No known significant effects or critical hazards.

10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.
Section 4. First aid measures

**Skin contact**: PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No known significant effects or critical hazards.

**Ingestion**: PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No known significant effects or critical hazards.

**Protection of first-aiders**:
No action shall be taken involving any personal risk or without suitable training.

**10X Cloned Pfu Reaction Buffer**
No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**Notes to physician**:
Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Inhalation**:
No specific data.

**Over-exposure signs/symptoms**:

**Eye contact**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

**Inhalation**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Skin contact**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Ingestion**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Specific treatments**:
No specific treatment.

**Protection of first-aiders**:
No action shall be taken involving any personal risk or without suitable training.

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

**Eye contact**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Inhalation**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Skin contact**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Ingestion**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Over-exposure signs/symptoms**:

**Eye contact**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Inhalation**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Skin contact**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Ingestion**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific data.

**Indication of immediate medical attention and special treatment needed, if necessary**

**Notes to physician**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
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.

**Specific treatments**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
No specific treatment.

**Protection of first-aiders**:
No action shall be taken involving any personal risk or without suitable training.

It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Firefighting measures

**Extinguishing media**

**Suitable extinguishing media**:
PfuTurbo Hotstart DNA polymerase
10X Cloned Pfu Reaction Buffer
Use an extinguishing agent suitable for the surrounding fire.

Use an extinguishing agent suitable for the surrounding fire.
Section 5. Firefighting measures

| Unsuitable extinguishing media | PfuTurbo Hotstart DNA polymerase | None known. |
| 10X Cloned Pfu Reaction Buffer | None known. |

| Specific hazards arising from the chemical | PfuTurbo Hotstart DNA polymerase | In a fire or if heated, a pressure increase will occur and the container may burst. |
| 10X Cloned Pfu Reaction Buffer | In a fire or if heated, a pressure increase will occur and the container may burst. |

| Hazardous thermal decomposition products | PfuTurbo Hotstart DNA polymerase | Decomposition products may include the following materials: |
| 10X Cloned Pfu Reaction Buffer | Decomposition products may include the following materials: | carbon dioxide |
| | carbon monoxide | nitrogen oxides |
| | sulfur oxides | halogenated compounds |

| Special protective actions for fire-fighters | PfuTurbo Hotstart DNA polymerase | 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. |
| 10X Cloned Pfu Reaction Buffer | 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 | PfuTurbo Hotstart DNA polymerase | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |
| 10X Cloned Pfu Reaction Buffer | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |

Section 6. Accidental release measures

| Personal precautions, protective equipment and emergency procedures | PfuTurbo Hotstart DNA polymerase |
| For non-emergency personnel | 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 Cloned Pfu 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. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
Section 6. Accidental release measures

For emergency responders:

- **PfuTurbo Hotstart 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 Cloned Pfu 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".

Environmental precautions:

- **PfuTurbo Hotstart 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 Cloned Pfu 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).

Methods and material for containment and cleaning up

- Methods for cleaning up:

- **PfuTurbo Hotstart DNA polymerase**: 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.

- **10X Cloned Pfu Reaction Buffer**: 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.

Section 7. Handling and storage

Precautions for safe handling

- **Protective measures**: Put on appropriate personal protective equipment (see Section 8). Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. 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.

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

- **10X Cloned Pfu 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.
Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities

- **PfuTurbo Hotstart 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 Cloned Pfu 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.

Section 8. Exposure controls and personal protection

**Control parameters**

**Occupational exposure limits**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PfuTurbo Hotstart DNA polymerase</strong></td>
<td><strong>Safe Work Australia (Australia, 1/2014).</strong> TWA: 10 mg/m³ 8 hours.</td>
</tr>
<tr>
<td><strong>Glycerol</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**

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

**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.

**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: chemical splash goggles.

**Skin protection**

**Hand protection**

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately...
Section 8. Exposure controls and 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.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**: Liquid.

**Colour**: Not available.

**Odour**: Not available.

**Odour threshold**: Not available.

**pH**: 8.2

**Melting point**: Not available.

**Boiling point**: Not available.

**Flash point**: Not available.

**Evaporation rate**: Not available.

**Flammability (solid, gas)**: Not applicable.

**Lower and upper explosive (flammable) limits**: Not available.
Section 9. Physical and chemical properties

Vapour pressure: Not available.

Vapour density: Not available.

Relative density: Not available.

Solubility: Soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water: Not available.

Auto-ignition temperature: Not available.

Decomposition temperature: Not available.

Viscosity: Not available.

Section 10. Stability and reactivity

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

Chemical stability: The product is stable.

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

Conditions to avoid: No specific data.

Incompatible materials: May react or be incompatible with oxidising materials.
### Section 10. Stability and reactivity

#### Hazardous decomposition products

| Product/ingredient name                          | Result                          | Species | Dose       | Exposure
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo Hotstart DNA polymerase</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>1800 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Section 11. Toxicological information

#### Information on toxicological effects

##### Acute toxicity

<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>PfuTurbo Hotstart DNA polymerase</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td></td>
<td>24 hours 500 milligrams</td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 500 milligrams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 500 milligrams</td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td></td>
<td>24 hours 500 microliters</td>
<td></td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 10 microliters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 500 microliters</td>
<td></td>
</tr>
</tbody>
</table>

##### Irritation/Corrosion

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo Hotstart DNA polymerase</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 500 milligrams</td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 500 milligrams</td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 10 microliters</td>
<td></td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td></td>
<td>24 hours 500 microliters</td>
<td></td>
</tr>
</tbody>
</table>

##### Sensitisation

Not available.

##### Mutagenicity

Not available.

##### Carcinogenicity

Not available.

##### Reproductive toxicity

Not available.

##### Teratogenicity

Not available.

##### Specific target organ toxicity (single exposure)

Not available.

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

Not available.

##### Aspiration hazard

Not available.
Section 11. Toxicological information

Information on likely routes of exposure:

**PfuTurbo Hotstart DNA polymerase**

10X Cloned Pfu Reaction Buffer

Routes of entry anticipated: Oral, Dermal, Inhalation.

**Potential acute health effects**

**Eye contact**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Inhalation**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Skin contact**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Ingestion**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics:

**Eye contact**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No specific data.

Adverse symptoms may include the following:

- pain or irritation
- watering
- redness

**Inhalation**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No specific data.

**Skin contact**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No specific data.

**Ingestion**

PfuTurbo Hotstart DNA polymerase

10X Cloned Pfu Reaction Buffer

No specific data.

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

**Short term exposure**

**Potential immediate effects**

Not available.

**Potential delayed effects**

Not available.

**Long term exposure**

**Potential immediate effects**

Not available.

**Potential delayed effects**

Not available.

**Potential chronic health effects**

Not available.
Section 11. Toxicological information

General: No known significant effects or critical hazards.
10X Cloned Pfu Reaction Buffer: No known significant effects or critical hazards.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>180000 mg/kg</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo Hotstart DNA</td>
<td>Acute LC50 54000 mg/l</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>polymerase</td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction</td>
<td>Acute LC50 5.85 mg/l</td>
<td>Crustaceans - Ceriodaphnia rigaudi - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td>Buffer</td>
<td>Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td></td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl</td>
<td>Acute LC50 11.2 mg/l</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td>ether</td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute LC50 4500 μg/l</td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability

<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 Cloned Pfu Reaction</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Buffer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ether</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 12. Ecological information

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP&lt;sub&gt;ow&lt;/sub&gt;</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo Hotstart DNA polymerase</td>
<td>-1.76</td>
<td>-</td>
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</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
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</tr>
<tr>
<td>Polyoxethylene octyl phenyl ether</td>
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</tbody>
</table>

Mobility in soil

- Soil/water partition coefficient (K<sub>Oc</sub>): Not available.

Other adverse effects

- No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

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. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. 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 spill material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

ADG / IMDG / IATA

- Not regulated as Dangerous Goods according to the ADG Code.

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.

Transport in bulk according to Annex II of Marpol and the IBC Code

- Not available.

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

- Chemical Weapon Convention List Schedules I, II & III Chemicals
  Not listed.

- Montreal Protocol (Annexes A, B, C, E)
  Not listed.

- Stockholm Convention on Persistent Organic Pollutants

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Date of previous issue: 30/01/2015
Version: 4
**Section 15. Regulatory information**

Not listed.

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

**UNECE Aarhus Protocol on POPs and Heavy Metals**
Not listed.

**Inventory list**

<table>
<thead>
<tr>
<th>Country</th>
<th>Status</th>
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<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Canada</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>China</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Europe</td>
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<tr>
<td>Japan</td>
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<tr>
<td>New Zealand</td>
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<tr>
<td>Philippines</td>
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**Section 16. Any other relevant information**

**History**

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<th>31/05/2017</th>
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<td>30/01/2015</td>
</tr>
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**Key to abbreviations**

- ADG = Australian Dangerous Goods
- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- NOHSC = National Occupational Health and Safety Commission
- SUSMP = Standard Uniform Schedule of Medicine and Poisons
- UN = United Nations

**Procedure used to derive the classification**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
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<td>10X Cloned Pfu Reaction Buffer</td>
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<tr>
<td>Eye Irrit. 2A, H319</td>
<td>Calculation method</td>
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</table>

**References**

- Not available.

**INDICATES information that has changed from previously issued version.**

**Notice to reader**

Disclaimer: The information contained in this document is based on Agilent’s state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

**Date of issue/Date of revision**: 31/05/2017  **Date of previous issue**: 30/01/2015  **Version**: 4