Section 1. Identification

Product identifier: PfuTurbo Hotstart DNA Polymerase, Part Number 600320
Part No. (Chemical Kit): 600320
Part No.: PfuTurbo Hotstart DNA Polymerase 600320-51
10X Cloned Pfu Reaction Buffer 600153-82

Supplier/Manufacturer: Agilent Technologies Australia Pty Ltd
679 Springvale Road
Mulgrave
Victoria 3170, Australia
1800 802 402

Emergency telephone number (with hours of operation): CHEMTREC®: +(61)-290372994

Section 2. Hazard(s) identification

Classification of the substance or mixture
10X Cloned Pfu Reaction Buffer
H319

SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A

GHS label elements

Hazard pictograms: 10X Cloned Pfu Reaction Buffer

Signal word: PuTurbo Hotstart DNA Polymerase
10X Cloned Pfu Reaction Buffer
No signal word.

WARNING

Hazard statements:
No known significant effects or critical hazards.
H319 - Causes serious eye irritation.

Precautionary statements
Section 2. Hazard(s) identification

**Prevention**
- **PfuTurbo Hotstart DNA Polymerase**
  - Not applicable.
- **10X Cloned Pfu Reaction Buffer**
  - P280 - Wear eye or face protection.
  - P264 - Wash hands thoroughly after handling.

**Response**
- **PfuTurbo Hotstart DNA Polymerase**
  - Not applicable.
- **10X Cloned Pfu Reaction Buffer**
  - P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P337 + P313 - If eye irritation persists: Get medical attention.

**Storage**
- **PfuTurbo Hotstart DNA Polymerase**
  - Not applicable.
- **10X Cloned Pfu Reaction Buffer**
  - Not applicable.

**Disposal**
- **PfuTurbo Hotstart DNA Polymerase**
  - Not applicable.
- **10X Cloned Pfu Reaction Buffer**
  - Not applicable.

**Supplemental label elements**
- **PfuTurbo Hotstart DNA Polymerase**
  - Not applicable.
- **10X Cloned Pfu Reaction Buffer**
  - Not applicable.

**Other hazards which do not result in classification**
- **PfuTurbo Hotstart DNA Polymerase**
  - None known.
- **10X Cloned Pfu Reaction Buffer**
  - None known.

Section 3. Composition and ingredient information

**Substance/mixture**
- **PfuTurbo Hotstart DNA Polymerase**
  - Mixture
- **10X Cloned Pfu Reaction Buffer**
  - 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**
  - 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.
- **10X Cloned Pfu Reaction Buffer**
  - 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.

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

Specific treatments:
No specific treatment.

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

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.

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.

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

Specific treatments:
No specific treatment.

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

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

Inhalation:
No specific data.

Skin contact:
No specific data.

Ingestion:
No specific data.

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

Specific treatments:
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.

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.

See toxicological information (Section 11)
Section 5. Firefighting measures

<table>
<thead>
<tr>
<th>Unsuitable extinguishing media</th>
<th>PfuTurbo Hotstart DNA Polymerase</th>
<th>None known.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>None known.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific hazards arising from the chemical</th>
<th>PfuTurbo Hotstart DNA Polymerase</th>
<th>In a fire or if heated, a pressure increase will occur and the container may burst.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous thermal decomposition products</th>
<th>PfuTurbo Hotstart DNA Polymerase</th>
<th>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, halogenated compounds.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, halogenated compounds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special protective actions for fire-fighters</th>
<th>PfuTurbo Hotstart DNA Polymerase</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special protective equipment for fire-fighters</th>
<th>PfuTurbo Hotstart DNA Polymerase</th>
<th>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
</tbody>
</table>

Section 6. Accidental release measures

<table>
<thead>
<tr>
<th>Personal precautions, protective equipment and emergency procedures</th>
<th>PfuTurbo Hotstart DNA Polymerase</th>
<th>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For non-emergency personnel</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</td>
</tr>
</tbody>
</table>
### 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 for cleaning up**

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.

**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".

### Section 7. Handling and storage

**Precautions for safe handling**

**Protective measures**: PfuTurbo Hotstart DNA Polymerase

Put on appropriate personal protective equipment (see Section 8).

10X Cloned Pfu Reaction Buffer

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**: PfuTurbo Hotstart 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 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>Safe Work Australia (Australia, 1/2014). 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:
- PfuTurbo Hotstart DNA Polymerase: Liquid.
- 10X Cloned Pfu Reaction Buffer: Liquid.

Colour:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

Odour:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

Odour threshold:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

pH:
- PfuTurbo Hotstart DNA Polymerase: 8.2
- 10X Cloned Pfu Reaction Buffer: 8.8

Melting point:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

Boiling point:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

Flash point:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

Evaporation rate:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

Flammability (solid, gas):
- PfuTurbo Hotstart DNA Polymerase: Not applicable.
- 10X Cloned Pfu Reaction Buffer: Not applicable.

Lower and upper explosive (flammable) limits:
- PfuTurbo Hotstart DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.
Section 9. Physical and chemical properties

Vapour pressure: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Vapour density: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Relative density: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Solubility: PfuTurbo Hotstart DNA Polymerase Soluble in the following materials: cold water and hot water.
10X Cloned Pfu Reaction Buffer Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Auto-ignition temperature: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Decomposition temperature: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Viscosity: PfuTurbo Hotstart DNA Polymerase Not available.
10X Cloned Pfu Reaction Buffer Not available.

Section 10. Stability and reactivity

Reactivity: PfuTurbo Hotstart DNA Polymerase No specific test data related to reactivity available for this product or its ingredients.
10X Cloned Pfu Reaction Buffer No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: PfuTurbo Hotstart DNA Polymerase The product is stable.
10X Cloned Pfu Reaction Buffer The product is stable.

Possibility of hazardous reactions: PfuTurbo Hotstart DNA Polymerase Under normal conditions of storage and use, hazardous reactions will not occur.
10X Cloned Pfu Reaction Buffer Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: PfuTurbo Hotstart DNA Polymerase No specific data.
10X Cloned Pfu Reaction Buffer No specific data.

Incompatible materials: PfuTurbo Hotstart DNA Polymerase May react or be incompatible with oxidising materials.
10X Cloned Pfu Reaction Buffer May react or be incompatible with oxidising materials.
Section 10. Stability and reactivity

Hazardous decomposition products: PfuTurbo Hotstart DNA Polymerase

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

10X Cloned Pfu Reaction Buffer

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>Dose</th>
<th>Exposure</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>

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

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Substance</th>
<th>Routes of entry anticipated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>Oral, Dermal, Inhalation</td>
</tr>
<tr>
<td>Inhalation</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Oral, Dermal, Inhalation</td>
</tr>
</tbody>
</table>

Potential acute health effects

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Substance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

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

Symptoms related to the physical, chemical and toxicological characteristics

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Substance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Eye contact</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Adverse symptoms may include the following:</td>
</tr>
<tr>
<td>Inhalation</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>PfuTurbo Hotstart DNA Polymerase 10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>No specific data.</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: Not available.
### Section 11. Toxicological information

**General**
- PfuTurbo Hotstart DNA Polymerase
- 10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

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

**Carcinogenicity**
- PfuTurbo Hotstart DNA Polymerase
- 10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Mutagenicity**
- PfuTurbo Hotstart DNA Polymerase
- 10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Teratogenicity**
- PfuTurbo Hotstart DNA Polymerase
- 10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Developmental effects**
- PfuTurbo Hotstart DNA Polymerase
- 10X Cloned Pfu Reaction Buffer

No known significant effects or critical hazards.

**Fertility effects**
- PfuTurbo Hotstart DNA Polymerase
- 10X Cloned Pfu Reaction Buffer

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 Oral</td>
<td>180000 mg/kg</td>
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</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 Polymerase Glycerol</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer Polyoxyethylene octyl phenyl ether</td>
<td>Acute LC50 5.85 mg/l Fresh water</td>
<td>Crustaceans - Ceriodaphnia rigaudei - 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>

#### 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 Buffer Polyoxyethylene octyl phenyl ether</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
</tbody>
</table>

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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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>-1.76</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>4.86</td>
<td>-</td>
<td>high</td>
</tr>
</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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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>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<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>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Japan</td>
<td>Japan inventory (ENCS): Not determined.</td>
</tr>
<tr>
<td></td>
<td>Japan inventory (ISHL): Not determined.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Not determined.</td>
</tr>
<tr>
<td>New Zealand</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Philippines</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Taiwan</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Thailand</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Turkey</td>
<td>Not determined.</td>
</tr>
<tr>
<td>United States</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

Section 16. Any other relevant information

History

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| Version                       | : 4         |

Key to abbreviations

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

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2A, H319</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

References

Not available.

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