Section 1. Identification

1.1 Product identifier

Product name: Cloned Pfu DNA Polymerase- 100 U, Part Number 600153
Part no. (chemical kit): 600153
Part no.: Cloned Pfu DNA Polymerase 600153-81
10X Cloned Pfu Reaction Buffer 600153-82
Validation date: 10/31/2022

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

Identified uses: Analytical reagent.
Cloned Pfu DNA Polymerase 0.04 ml (100 U 2.5 U/µl)
10X Cloned Pfu Reaction Buffer 1 ml

1.3 Details of the supplier of the safety data sheet

Supplier/Manufacturer: Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

1.4 Emergency telephone number

In case of emergency: CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status: Cloned Pfu DNA Polymerase
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
10X Cloned Pfu Reaction Buffer This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

Cloned Pfu DNA Polymerase
H320 EYE IRRITATION - Category 2B
10X Cloned Pfu Reaction Buffer
H319 EYE IRRITATION - Category 2A
H412 AQUATIC HAZARD (LONG-TERM) - Category 3

2.2 GHS label elements

Hazard pictograms: 10X Cloned Pfu Reaction Buffer

Signal word: Cloned Pfu DNA Polymerase Warning
10X Cloned Pfu Reaction Buffer Warning

Hazard statements: Cloned Pfu DNA Polymerase
H320 - Causes eye irritation.
H319 - Causes serious eye irritation.
H412 - Harmful to aquatic life with long lasting effects.
10X Cloned Pfu Reaction Buffer

Precautionary statements

Date of issue: 10/31/2022
Section 2. Hazards identification

Prevention : Cloned Pfu DNA Polymerase
10X Cloned Pfu Reaction Buffer Not applicable.

Response : Cloned Pfu DNA Polymerase
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 advice or attention.

Storage : Cloned Pfu DNA Polymerase Not applicable.
10X Cloned Pfu Reaction Buffer Not applicable.

Disposal : Cloned Pfu DNA Polymerase Not applicable.
10X Cloned Pfu Reaction Buffer
P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Cloned Pfu DNA Polymerase None known.
10X Cloned Pfu Reaction Buffer None known.

2.3 Other hazards

Hazard not otherwise classified : Cloned Pfu DNA Polymerase None known.
10X Cloned Pfu Reaction Buffer None known.

Section 3. Composition/information on ingredients

Substance/mixture : Cloned Pfu DNA Polymerase Mixture
10X Cloned Pfu Reaction Buffer Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥50 - ≤75</td>
<td>56-81-5</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-</td>
<td>&lt;0.1</td>
<td>9036-19-5</td>
</tr>
</tbody>
</table>

10X Cloned Pfu Reaction Buffer

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulphate</td>
<td>≤3</td>
<td>7783-20-2</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>&lt;2.5</td>
<td>9002-93-1</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.
## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

<table>
<thead>
<tr>
<th>Eye contact</th>
<th>Cloned Pfu DNA Polymerase</th>
<th>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Cloned Pfu DNA Polymerase</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>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.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>Cloned Pfu DNA Polymerase</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>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.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Cloned Pfu DNA Polymerase</td>
<td>Wash out mouth with water. Remove dentures if any. 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</td>
</tr>
</tbody>
</table>

**Date of issue:** 10/31/2022
Section 4. First aid measures

10X Cloned Pfu Reaction Buffer

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact  : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   Causes eye irritation.

Inhalation  : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No known significant effects or critical hazards.

Skin contact : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No known significant effects or critical hazards.

Ingestion   : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact  : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   Adverse symptoms may include the following:
       irritation
       watering
       redness

Inhalation  : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No specific data.

Skin contact : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No specific data.

Ingestion   : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No specific data.

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

Notes to physician  : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : Cloned Pfu DNA Polymerase
               10X Cloned Pfu Reaction Buffer
   No specific treatment.
**Section 4. First aid measures**

<table>
<thead>
<tr>
<th>Protection of first-aiders</th>
<th>Cloned Pfu DNA Polymerase</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

See toxicological information (Section 11)

**Section 5. Fire-fighting measures**

<table>
<thead>
<tr>
<th>Suitable extinguishing media</th>
<th>Cloned Pfu DNA Polymerase</th>
<th>Use an extinguishing agent suitable for the surrounding fire.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td></td>
</tr>
</tbody>
</table>

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

**5.1 Extinguishing media**

<table>
<thead>
<tr>
<th>Suitable extinguishing media</th>
<th>Cloned Pfu DNA Polymerase</th>
<th>Use an extinguishing agent suitable for the surrounding fire.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Specific hazards arising from the chemical</th>
<th>Cloned Pfu 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>10X Cloned Pfu Reaction Buffer</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous thermal decomposition products</th>
<th>Cloned Pfu DNA Polymerase</th>
<th>Decomposition products may include the following materials: carbon dioxide carbon monoxide</th>
</tr>
</thead>
<tbody>
<tr>
<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>
<td></td>
</tr>
</tbody>
</table>

**5.3 Advice for firefighters**

<table>
<thead>
<tr>
<th>Special protective actions for fire-fighters</th>
<th>Cloned Pfu 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>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>
<td></td>
</tr>
</tbody>
</table>
Section 5. Fire-fighting measures

**Special protective equipment for fire-fighters**

- Cloned Pfu 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

6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**

- Cloned Pfu 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders**

- Cloned Pfu DNA Polymerase: If specialized 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 specialized 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

- Cloned Pfu DNA Polymerase: Avoid dispersal of spilled 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 spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up

Date of issue: 10/31/2022
### Section 6. Accidental release measures

<table>
<thead>
<tr>
<th>Methods for cleaning up</th>
<th>Cloned Pfu DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td></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>

| 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

#### 7.1 Precautions for safe handling

<table>
<thead>
<tr>
<th>Protective measures</th>
<th>Cloned Pfu DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor 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.</td>
<td></td>
</tr>
</tbody>
</table>

| 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 vapor or mist. Avoid release to the environment. 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

| Cloned Pfu 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. |

#### 7.2 Conditions for safe storage, including any incompatibilities

| Cloned Pfu 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 unlabeled 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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |
Section 7. Handling and storage

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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>TWA: 5 mg/m³ 8 hours. Form: Respirable fraction</td>
</tr>
<tr>
<td></td>
<td>TWA: 10 mg/m³ 8 hours. Form: Total dust</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>OSHA PEL (United States, 5/2018).</td>
</tr>
<tr>
<td></td>
<td>TWA: 5 mg/m³ 8 hours. Form: Respirable fraction</td>
</tr>
<tr>
<td></td>
<td>TWA: 15 mg/m³ 8 hours. Form: Total dust</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-omega.-hydroxy-</td>
<td>None.</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>None.</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>None.</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td>None.</td>
</tr>
</tbody>
</table>

Biological exposure indices

No exposure indices known.

8.2 Exposure controls

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

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### Section 8. Exposure controls/personal protection

**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 estimated.

**Body protection**: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

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

### Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

**Appearance**

**Physical state**
- Cloned Pfu DNA Polymerase: Liquid.
- 10X Cloned Pfu Reaction Buffer: Liquid.

**Color**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Odor**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Odor threshold**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

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

**Melting point/freezing point**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Boiling point, initial boiling point, and boiling range**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Flash point**
- :
Section 9. Physical and chemical properties and safety characteristics

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Closed cup</th>
<th>Open cup</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>251</td>
<td>483.8</td>
</tr>
</tbody>
</table>

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

**Flammability**
- Cloned Pfu DNA Polymerase: Not applicable.
- 10X Cloned Pfu Reaction Buffer: Not applicable.

**Lower and upper explosion limit/flammability limit**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Vapor pressure**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Vapor Pressure at 20°C</th>
<th>Vapor pressure at 50°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm Hg</td>
<td>kPa</td>
</tr>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>water</td>
<td>23.8</td>
<td>3.2</td>
</tr>
<tr>
<td>Glycerol</td>
<td>0.000075</td>
<td>0.00001</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>water</td>
<td>23.8</td>
<td>3.2</td>
</tr>
<tr>
<td>Polyoxylane octyl phenyl ether</td>
<td>0.997581</td>
<td>0.13</td>
</tr>
</tbody>
</table>

**Relative vapor density**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Relative density**
- Cloned Pfu DNA Polymerase: Not available.
- 10X Cloned Pfu Reaction Buffer: Not available.

**Solubility(ies)**

<table>
<thead>
<tr>
<th>Media</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td>Soluble</td>
</tr>
<tr>
<td>water</td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td></td>
</tr>
<tr>
<td>water</td>
<td>Soluble</td>
</tr>
</tbody>
</table>

**Partition coefficient: n-octanol/water**
- Cloned Pfu DNA Polymerase: Not applicable.
- 10X Cloned Pfu Reaction Buffer: Not applicable.

**Auto-ignition temperature**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>°C</th>
<th>°F</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td>370</td>
<td>698</td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Date of issue:** 10/31/2022
Section 9. Physical and chemical properties and safety characteristics

<table>
<thead>
<tr>
<th>Property</th>
<th>Cloned Pfu DNA Polymerase</th>
<th>10X Cloned Pfu Reaction Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Particle characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median particle size</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

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

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

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

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

10.5 Incompatible materials: Cloned Pfu DNA Polymerase
10X Cloned Pfu Reaction Buffer
- May react or be incompatible with oxidizing materials.

10.6 Hazardous decomposition products: Cloned Pfu DNA Polymerase
10X Cloned Pfu Reaction Buffer
- 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>Cloned Pfu DNA Polymerase</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2800 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1,1,3,3-tetramethylbutyl) phenyl]-.omega.-hydroxy-</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>2840 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ammonium sulphate</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>

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Section 11. Toxicological information

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>Cloned Pfu DNA Polymerase</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 mg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 mg</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>Eyes - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>1 %</td>
<td>-</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-</td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 μL</td>
<td>-</td>
</tr>
</tbody>
</table>

Sensitization
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)
Not available.

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on the likely routes of exposure:
- Cloned Pfu DNA Polymerase: Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
- 10X Cloned Pfu Reaction Buffer: Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Eye contact
- Cloned Pfu DNA Polymerase: Causes eye irritation.
- 10X Cloned Pfu Reaction Buffer: Causes serious eye irritation.

Inhalation
- Cloned Pfu DNA Polymerase: No known significant effects or critical hazards.
- 10X Cloned Pfu Reaction Buffer: No known significant effects or critical hazards.

Skin contact
- Cloned Pfu DNA Polymerase: No known significant effects or critical hazards.
- 10X Cloned Pfu Reaction Buffer: No known significant effects or critical hazards.

Ingestion
- Cloned Pfu DNA Polymerase: No known significant effects or critical hazards.
- 10X Cloned Pfu Reaction Buffer: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

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Eye contact: Cloned Pfu DNA Polymerase
Adverse symptoms may include the following:
- irritation
- watering
- redness

10X Cloned Pfu Reaction Buffer
Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

Inhalation: Cloned Pfu DNA Polymerase
No specific data.

10X Cloned Pfu Reaction Buffer
No specific data.

Skin contact: Cloned Pfu DNA Polymerase
No specific data.

10X Cloned Pfu Reaction Buffer
No specific data.

Ingestion: Cloned Pfu DNA Polymerase
No specific data.

10X Cloned Pfu Reaction Buffer
No specific data.

Delayed and immediate effects and also 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: Cloned Pfu DNA Polymerase
No known significant effects or critical hazards.

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

Carcinogenicity: Cloned Pfu DNA Polymerase
No known significant effects or critical hazards.

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

Mutagenicity: Cloned Pfu DNA Polymerase
No known significant effects or critical hazards.

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

Reproductive toxicity: Cloned Pfu DNA Polymerase
No known significant effects or critical hazards.

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

Numerical measures of toxicity

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 (vapors) (mg/l)</th>
<th>Inhalation (dusts and mists) (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td>12600</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Glycerol</td>
<td>500</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha-[1,1,3,3-tetramethylbutyl]phenyl]-.omega.-hydroxy-</td>
<td>1800</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>98687.3</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>2840</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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## 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>Cloned Pfu DNA Polymerase</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 210 µg/l Fresh water</td>
<td>Algae - Selenastrum sp.</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 10800 µg/l Marine water</td>
<td>Crustaceans - Pandalus montagui - Adult</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 8600 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 7200 µg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</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>Ammonium sulphate</td>
<td></td>
<td>Crustaceans - Ceriodaphnia rigaudii - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 5.85 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 11.2 mg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 4500 µg/l Fresh water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 12.2 Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td>301D Ready Biodegradability - Closed Bottle Test</td>
<td>93 % - 30 days</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[ (1,1,3,3-tetramethylbutyl) phenyl].omega.-hydroxy-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 12.3 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>Cloned Pfu DNA Polymerase</td>
<td>-1.76</td>
<td>78.67</td>
<td>low</td>
</tr>
<tr>
<td>Glycerol</td>
<td>2.7</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[ (1,1,3,3-tetramethylbutyl) phenyl].omega.-hydroxy-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>-5.1</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Section 12. Ecological information

<table>
<thead>
<tr>
<th>Substance</th>
<th>Partition Coefficient (K_OC)</th>
<th>Mobility</th>
<th>Soil/Water Partition Coefficient (K_OC)</th>
<th>Not available.</th>
</tr>
</thead>
</table>

12.4 Mobility in soil

Soil/water partition coefficient (K_OC) : Not available.

12.5 Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

13.1 Waste treatment methods

Disposal methods : The generation of waste should be avoided or minimized 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 spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT / TDG / Mexico / IMDG / IATA : Not regulated.

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 IMO instruments : Not available.

Section 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Federal regulations : TSCA 8(a) PAIR: Polyoxylethylene octyl phenyl ether; Poly(oxy-1,2-ethanediyl), .alpha.-[1,1,3,3-tetramethylbutyl]phenyl-.omega.-hydroxy-

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Water Act (CWA) 311: Edetic acid

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Section 15. Regulatory information

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)
Clean Air Act Section 602 Class I Substances
Clean Air Act Section 602 Class II Substances
DEA List I Chemicals (Precursor Chemicals)
DEA List II Chemicals (Essential Chemicals)

SARA 302/304
Composition/information on ingredients
No products were found.

SARA 304 RQ
: Not applicable.

SARA 311/312
Classification
: Cloned Pfu DNA Polymerase 10X Cloned Pfu Reaction Buffer

Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td>≥50 - ≤75</td>
<td>EYE IRRITATION - Category 2B</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>≤3</td>
<td>EYE IRRITATION - Category 2A</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>&lt;2.5</td>
<td>ACUTE TOXICITY (oral) - Category 4</td>
</tr>
<tr>
<td>Polyoxyethylene octyl phenyl ether</td>
<td></td>
<td>SKIN IRRITATION - Category 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SERIOUS EYE DAMAGE - Category 1</td>
</tr>
</tbody>
</table>

SARA 313

<table>
<thead>
<tr>
<th>Name</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form R - Reporting requirements</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>7783-20-2</td>
<td>≤3</td>
</tr>
<tr>
<td>Supplier notification</td>
<td>10X Cloned Pfu Reaction Buffer</td>
<td>7783-20-2</td>
<td>≤3</td>
</tr>
</tbody>
</table>

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations
Massachusetts
: The following components are listed: GLYCERINE MIST
New York
: None of the components are listed.
New Jersey
: The following components are listed: GLYCERIN
Pennsylvania
: The following components are listed: 1,2,3-PROPANETRIOL

California Prop. 65
This product does not require a Safe Harbor warning under California Prop. 65.

International regulations
Chemical Weapon Convention List Schedules I, II & III Chemicals
Not listed.
Montreal Protocol

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Not listed.

Stockholm Convention on Persistent Organic Pollutants
Not listed.

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

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

Inventory list

Australia: All components are listed or exempted.
Canada: All components are listed or exempted.
China: All components are listed or exempted.
Eurasian Economic Union: Russian Federation inventory: All components are listed or exempted.
Japan: Japan inventory (CSCL): Not determined.
                Japan inventory (ISHL): Not determined.
New Zealand: All components are listed or exempted.
Philippines: All components are listed or exempted.
Republic of Korea: Not determined.
Taiwan: All components are listed or exempted.
Thailand: Not determined.
Turkey: Not determined.
United States: All components are active or exempted.
Viet Nam: All components are listed or exempted.

Section 16. Other information

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloned Pfu DNA Polymerase</td>
<td></td>
</tr>
<tr>
<td>EYE IRRITATION - Category 2B</td>
<td>Calculation method</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer</td>
<td></td>
</tr>
<tr>
<td>EYE IRRITATION - Category 2A</td>
<td>Calculation method</td>
</tr>
<tr>
<td>AQUATIC HAZARD (LONG-TERM) - Category 3</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

History

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Date of previous issue: 09/25/2019
Version: 7

Key to abbreviations:
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
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973
as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
UN = United Nations

Indicates information that has changed from previously issued version.
Notice to reader

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