Section 1. Identification

1.1 Product identifier
Product name: PfuTurbo DNA Polymerase AD, Part Number 600255
Part No. (Chemical Kit) : 600255
Part No.: PfuTurbo DNA Polymerase AD 600255-52
10X Cloned Pfu Reaction Buffer AD 600157-82
Validation date : 4/28/2017

1.2 Relevant identified uses of the substance or mixture and uses advised against
Material uses: Analytical reagent.
PfuTurbo DNA Polymerase AD 0.04 ml (100 U 2.5 U/µl)
10X Cloned Pfu Reaction Buffer AD 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: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture
PfuTurbo DNA Polymerase AD
H320 - Causes eye irritation.
10X Cloned Pfu Reaction Buffer AD

Ingredients of unknown toxicity : 10X Cloned Pfu Reaction Buffer AD
Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 3.2%

2.2 GHS label elements
Signal word: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
Warning
No signal word.

Hazard statements: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
H320 - Causes eye irritation.
No known significant effects or critical hazards.

Precautionary statements
Section 2. Hazards identification

**Prevention**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

P264 - Wash hands thoroughly after handling. Not applicable.

**Response**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

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. Not applicable.

**Storage**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

Not applicable. Not applicable.

**Disposal**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

Not applicable. Not applicable.

**Supplemental label elements**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

None known. None known.

2.3 Other hazards

**Hazards not otherwise classified**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

None known. None known.

Section 3. Composition/information on ingredients

**Substance/mixture**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo DNA Polymerase AD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥50 - ≤75</td>
<td>56-81-5</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer AD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride</td>
<td>≤4.9</td>
<td>1185-53-1</td>
</tr>
<tr>
<td>Dodecyldimethyl(3-sulphonatopropyl)ammonium</td>
<td>≤3</td>
<td>14933-08-5</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>&lt;2</td>
<td>7783-20-2</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 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

4.1 Description of necessary first aid measures

**Eye contact**: PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD

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.

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.
## Section 4. First aid measures

<table>
<thead>
<tr>
<th>Mode of Exposure</th>
<th>Substance</th>
<th>First Aid Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inhalation</strong></td>
<td>PfuTurbo DNA Polymerase AD</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 AD</td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. 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><strong>Skin contact</strong></td>
<td>PfuTurbo DNA Polymerase AD</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 AD</td>
<td>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>PfuTurbo DNA Polymerase AD</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer AD</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

#### Potential acute health effects

<table>
<thead>
<tr>
<th>Mode of Exposure</th>
<th>Substance</th>
<th>Symptom/Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>PfuTurbo DNA Polymerase AD</td>
<td>Causes eye irritation.</td>
</tr>
<tr>
<td></td>
<td>10X Cloned Pfu Reaction Buffer AD</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>
Section 4. First aid measures

Inhalation: PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD

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.

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.

Over-exposure signs/symptoms:

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

Skin contact:
- No specific data.

Ingestion:
- No specific data.

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

Notes to physician:
- PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD
- 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.

Protection of first-aiders:
- PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD
- 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. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media:
- PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD
- Use an extinguishing agent suitable for the surrounding fire.
- Use an extinguishing agent suitable for the surrounding fire.
Section 5. Fire-fighting measures

Unsuitable extinguishing media: PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD
None known.  None known.

5.2 Special hazards arising from the substance or mixture

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

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

5.3 Advice for firefighters

Special protective actions for fire-fighters:
- PfuTurbo DNA Polymerase AD
  - 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 AD
  - 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 DNA Polymerase AD
  - 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 AD
  - 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:
- PfuTurbo DNA Polymerase AD
  - 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 AD
  - 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. Put on appropriate personal protective equipment.

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Section 6. Accidental release measures

For emergency responders : PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
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 : PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
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).

6.3 Methods and materials for containment and cleaning up
Methods for cleaning up : PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
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 non-emergency personnel : PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
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
Protective measures : PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
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.

Advice on general occupational hygiene : PfuTurbo DNA Polymerase AD
10X Cloned Pfu Reaction Buffer AD
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

7.2 Conditions for safe storage, including any incompatibilities

- **PfuTurbo DNA Polymerase AD**
  - 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.

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

7.3 Specific end use(s)

- **Recommendations**
  - **PfuTurbo DNA Polymerase AD**
  - Industrial applications, Professional applications.
  - **10X Cloned Pfu Reaction Buffer AD**
  - Industrial applications, Professional applications.

- **Industrial sector specific solutions**
  - **PfuTurbo DNA Polymerase AD**
  - Not applicable.
  - **10X Cloned Pfu Reaction Buffer AD**
  - Not applicable.

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>PfuTurbo DNA Polymerase AD</td>
<td><strong>OSHA PEL 1989 (United States, 3/1989).</strong></td>
</tr>
<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></td>
<td><strong>OSHA PEL (United States, 2/2013).</strong></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>10X Cloned Pfu Reaction Buffer AD</td>
<td>None.</td>
</tr>
<tr>
<td>2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride</td>
<td>None.</td>
</tr>
<tr>
<td>Dodecyldimethyl(3-sulphonatopropyl)ammonium</td>
<td>None.</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>None.</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

**Date of issue:** 04/28/2017
Section 8. Exposure controls/personal protection

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: safety glasses with side-shields.

Skin protection

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

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state: PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD

Color: Not available.

Odor: Not available.

Odor threshold: Not available.

pH: PfuTurbo DNA Polymerase AD 10X Cloned Pfu Reaction Buffer AD

Melting point: Not available.
Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>PfuTurbo DNA Polymerase AD</th>
<th>10X Cloned Pfu Reaction Buffer AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in the following materials: cold water and hot water.</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability : The product is stable.
Section 10. Stability and reactivity

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

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

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

10.6 Hazardous decomposition products
- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
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>PfuTurbo DNA Polymerase AD Glycerol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer AD Ammonium sulphate</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2840 mg/kg</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 DNA Polymerase AD 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>
</tbody>
</table>

Sensitization
Not available.

Mutagenicity
Not available.

Carcinogenicity
Not available.

Reproductive toxicity
Not available.

Conclusion/Summary
Not available.

Date of issue: 04/28/2017
Section 11. Toxicological information

**Teratogenicity**
Not available.

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>10X Cloned Pfu Reaction Buffer AD</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride</td>
<td></td>
<td></td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Dodecyl(dimethyl(3-sulphonatopropyl)ammonium</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td></td>
</tr>
</tbody>
</table>

**Specific target organ toxicity (repeated exposure)**
Not available.

**Aspiration hazard**
Not available.

**Information on the likely routes of exposure**

- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
- Routes of entry anticipated: Oral, Dermal, Inhalation.

**Potential acute health effects**

**Eye contact**
- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
- Causes eye irritation.
- No known significant effects or critical hazards.

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

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

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

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

**Eye contact**
- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
- Adverse symptoms may include the following:
  - Irritation
  - Watering
  - Redness
- No specific data.

**Inhalation**
- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
- No specific data.
- No specific data.

**Skin contact**
- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
- No specific data.
- No specific data.

**Ingestion**
- PfuTurbo DNA Polymerase AD
- 10X Cloned Pfu Reaction Buffer AD
- No specific data.
- No specific data.

**Delayed and immediate effects and also chronic effects from short and long term exposure**

**Date of issue:** 04/28/2017
Section 11. Toxicological information

### 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**: PfuTurbo DNA Polymerase AD

- No known significant effects or critical hazards.

**Carcinogenicity**: PfuTurbo DNA Polymerase AD

- No known significant effects or critical hazards.

**Mutagenicity**: PfuTurbo DNA Polymerase AD

- No known significant effects or critical hazards.

**Teratogenicity**: PfuTurbo DNA Polymerase AD

- No known significant effects or critical hazards.

**Developmental effects**: PfuTurbo DNA Polymerase AD

- No known significant effects or critical hazards.

**Fertility effects**: PfuTurbo DNA Polymerase AD

- 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 AD Oral</td>
<td>22432.9 mg/kg</td>
</tr>
<tr>
<td></td>
<td>55000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>550 mg/l</td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
</tr>
<tr>
<td>Inhalation (vapors)</td>
<td></td>
</tr>
</tbody>
</table>

**Developmental effects**

- No known significant effects or critical hazards.

**Fertility effects**

- No known significant effects or critical hazards.

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>PfuTurbo DNA Polymerase AD 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 AD Ammonium sulphate</td>
<td>Acute LC50 2.6 mg/l Fresh water</td>
<td>Crustaceans - Ceriodaphnia dubia - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 14000 to 15000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Young</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

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Section 12. Ecological information

<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 AD</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**12.2 Persistence and degradability**

**Product/ingredient name**

**LogP<sub>ow</sub>**

**BCF**

**Potential**

| PfuTurbo DNA Polymerase AD | -1.76 | - | low |
| Glycerol | - | - | low |

**12.3 Bioaccumulative potential**

| PfuTurbo DNA Polymerase AD | -1.76 | - | low |
| Glycerol | - | - | low |

**12.4 Mobility in soil**

**Soil/water partition coefficient (K<sub>oc</sub>)**

: 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. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Section 13. Disposal considerations

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

Regulatory information
DOT / IMDG / IATA : Not regulated.

Section 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
U.S. Federal regulations
Clean Water Act (CWA) 311 : Edetic acid
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed
Clean Air Act Section 602 Class I Substances : Not listed
Clean Air Act Section 602 Class II Substances : Not listed
DEA List I Chemicals (Precursor Chemicals) : Not listed
DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304
Composition/information on ingredients
No products were found.
SARA 304 RQ : Not applicable.
SARA 311/312
Classification : Immediate (acute) health hazard

Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Fire hazard</th>
<th>Sudden release of pressure</th>
<th>Reactive</th>
<th>Immediate (acute) health hazard</th>
<th>Delayed (chronic) health hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>PfuTurbo DNA Polymerase AD</td>
<td>≥50 - ≤75</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10X Cloned Pfu Reaction Buffer AD</td>
<td>≤4.9</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td>Yes.</td>
<td>No.</td>
</tr>
<tr>
<td>2-Amino-2-(hydroxymethyl)propane-1, 3-diol hydrochloride</td>
<td>≤3</td>
<td>Yes.</td>
<td>No.</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>Dodecyldimethyl(3-sulphonatopropyl)</td>
<td></td>
<td>No.</td>
<td></td>
<td>No.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Section 15. Regulatory information

<table>
<thead>
<tr>
<th>ammonium</th>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulphate</td>
<td>&lt;2</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>

**SARA 313**

| Form R - Reporting requirements | 10X Cloned Pfu Reaction Buffer AD | 7783-20-2 | <2 |
| Supplier notification | 10X Cloned Pfu Reaction Buffer AD | 7783-20-2 | <2 |

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; 1,2,3-PROPANETRIOL

**Pennsylvania**
- The following components are listed: 1,2,3-PROPANETRIOL

**California Prop. 65**
- No products were found.

**International regulations**

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

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

**Stockholm Convention on Persistent Organic Pollutants**
- Not listed.

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

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

**Inventory list**

**Australia**
- Not determined.

**Canada inventory**
- Not determined.

**China**
- Not determined.

**Europe**
- Not determined.

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

**Malaysia**
- Not determined.

**New Zealand**
- Not determined.

**Philippines**
- Not determined.

**Republic of Korea**
- Not determined.

**Taiwan**
- All components are listed or exempted.

**Turkey**
- Not determined.
Section 16. Other information

History
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