SAFETY DATA SHEET
Herculase Enhanced DNA Polymerase, Part Number 600262

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

1.1 Product identifier
Product name: Herculase Enhanced DNA Polymerase, Part Number 600262
Part No. (Kit): 600262
Part No.: DMSO 600260-53
10X Herculase Reaction Buffer 600260-54
Herculase DNA Polymerase 600262-51

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

<table>
<thead>
<tr>
<th>Identified uses</th>
<th>Part No. (Kit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical reagent. DMSO 1 ml</td>
<td></td>
</tr>
<tr>
<td>10X Herculase Reaction Buffer 2 x 1 ml</td>
<td></td>
</tr>
<tr>
<td>Herculase DNA Polymerase 100 µl (500U 5U/µl)</td>
<td></td>
</tr>
</tbody>
</table>

1.3 Details of the supplier of the safety data sheet
Agilent Technologies Manufacturing GmbH & Co. KG
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000
e-mail address of person responsible for this SDS: pdl-msds_author@agilent.com

1.4 Emergency telephone number
Emergency telephone number (with hours of operation): CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Product definition:
DMSO Mono-constituent substance
10X Herculase Reaction Buffer Mixture
Herculase DNA Polymerase Mixture

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

Ingredients of unknown toxicity:
10X Herculase Reaction Buffer Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 10 - 30%
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 1 - 10%
Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 1 - 10%
Herculase DNA Polymerase Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%

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SECTION 2: Hazards identification

Ingredients of unknown ecotoxicity:
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase
- DMSO

See Section 11 for more detailed information on health effects and symptoms.
See Section 16 for the full text of the H statements declared above.

2.2 Label elements

Signal word:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Hazard statements:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Precautionary statements

Prevention:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Response:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Storage:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Disposal:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Hazardous ingredients:
- Herculase DNA Polymerase

Supplemental label elements:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

Special packaging requirements:
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

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Herculase Enhanced DNA Polymerase, Part Number 600262

SECTION 2: Hazards identification

2.3 Other hazards

Other hazards which do not result in classification:
- DMSO: None known.
- 10X Herculase Reaction Buffer: None known.
- Herculase DNA Polymerase: None known.

SECTION 3: Composition/information on ingredients

3.1 Substances:
- DMSO: Mono-constituent substance
- 10X Herculase Reaction Buffer: Mixture
- Herculase DNA Polymerase: Mixture

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Identifiers</th>
<th>%</th>
<th>Regulation (EC) No. 1272/2008 [CLP]</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>EC: 200-664-3, CAS: 67-68-5</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
<tr>
<td>Glycerol</td>
<td>REACH #: Annex V, EC: 200-289-5, CAS: 56-81-5, CAS: 9036-19-5</td>
<td>≤0.3</td>
<td>Skin Irrit. 2, H315, Eye Dam. 1, H318, Aquatic Chronic 2, H411</td>
<td>[1][5]</td>
</tr>
</tbody>
</table>

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

Type:
- [A] Substance classified with a health or environmental hazard
- [B] Substance with a workplace exposure limit
- [C] Substance with a workplace exposure limit
- [D] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [E] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [F] Substance of equivalent concern
- [G] Additional disclosure due to company policy
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact:
- DMSO: 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 Herculase Reaction Buffer: 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.
- Herculase 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.

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SECTION 4: First aid measures

**Inhalation**

- **DMSO**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- **10X Herculase Reaction Buffer**: 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.
- **Herculase DNA Polymerase**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

**Skin contact**

- **DMSO**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- **10X Herculase Reaction Buffer**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- **Herculase DNA Polymerase**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

**Ingestion**

- **DMSO**: 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 Herculase Reaction Buffer**: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
- **Herculase 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.

**Protection of first-aiders**

- **DMSO**: No action shall be taken involving any personal risk or without suitable training.
- **10X Herculase Reaction Buffer**: No action shall be taken involving any personal risk or without suitable training.
- **Herculase DNA Polymerase**: No action shall be taken involving any personal risk or without suitable training.

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

**Potential acute health effects**

<table>
<thead>
<tr>
<th>Contact Type</th>
<th>Substance</th>
<th>Symptoms and Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td><strong>DMSO</strong></td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td></td>
<td><strong>10X Herculase Reaction Buffer</strong></td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td></td>
<td><strong>Herculase DNA Polymerase</strong></td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td><strong>DMSO</strong></td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td></td>
<td><strong>10X Herculase Reaction Buffer</strong></td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td></td>
<td><strong>Herculase DNA Polymerase</strong></td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

**Date of issue/Date of revision**: 25/05/2017
### SECTION 4: First aid measures

**Skin contact**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

**Ingestion**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

**Over-exposure signs/symptoms**

**Eye contact**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

**Inhalation**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

**Skin contact**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

**Ingestion**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

4.3 Indication of any immediate medical attention and special treatment needed

**Notes to physician**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
<td>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>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>Specific treatments</td>
<td>No specific treatment.</td>
<td>No specific treatment.</td>
<td>No specific treatment.</td>
</tr>
</tbody>
</table>

### SECTION 5: Firefighting measures

**5.1 Extinguishing media**

**Suitable extinguishing media**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
</tbody>
</table>

**Unsuitable extinguishing media**

<table>
<thead>
<tr>
<th></th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>None known.</td>
<td>None known.</td>
<td>None known.</td>
</tr>
</tbody>
</table>

**Date of issue/Date of revision**

: 5/18

25/05/2017
### SECTION 5: Firefighting measures

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

<table>
<thead>
<tr>
<th>Substance or Mixture</th>
<th>Hazardous combustion products</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides</td>
</tr>
<tr>
<td>10X Herculase Reaction Buffer</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substance or Mixture</th>
<th>Special precautions for fire-fighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</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>
<tr>
<td>10X Herculase 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>
<tr>
<td>Herculase DNA Polymerase</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>

#### 5.3 Advice for firefighters

<table>
<thead>
<tr>
<th>Substance or Mixture</th>
<th>Special protective equipment for fire-fighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.</td>
</tr>
<tr>
<td>10X Herculase 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.</td>
</tr>
</tbody>
</table>
### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**

<table>
<thead>
<tr>
<th>Product</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.</td>
</tr>
<tr>
<td>10X Herculase Reaction Buffer</td>
<td>No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.</td>
</tr>
</tbody>
</table>

**For emergency responders**

<table>
<thead>
<tr>
<th>Product</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.</td>
</tr>
<tr>
<td>10X Herculase Reaction Buffer</td>
<td>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 &quot;For non-emergency personnel&quot;.</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>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 &quot;For non-emergency personnel&quot;.</td>
</tr>
</tbody>
</table>

#### 6.2 Environmental precautions

<table>
<thead>
<tr>
<th>Product</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>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).</td>
</tr>
<tr>
<td>10X Herculase Reaction Buffer</td>
<td>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).</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>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).</td>
</tr>
</tbody>
</table>

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

**Methods for cleaning up**

<table>
<thead>
<tr>
<th>Product</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</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>
<tr>
<td>10X Herculase Reaction Buffer</td>
<td>Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</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>
SECTION 6: Accidental release measures

6.4 Reference to other sections
See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures:
- DMSO: Put on appropriate personal protective equipment (see Section 8).
- 10X Herculase Reaction Buffer: Put on appropriate personal protective equipment (see Section 8).
- Herculase DNA Polymerase: Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene:
- DMSO: 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 Herculase 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.
- Herculase 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.

7.2 Conditions for safe storage, including any incompatibilities

Storage:
- DMSO: Storage temperature: -20°C (-4°F). 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 Herculase 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.
- Herculase 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.
SECTION 7: Handling and storage

7.3 Specific end use(s)

**Recommendations**
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

**Industrial sector specific solutions**
- DMSO
- 10X Herculase Reaction Buffer
- Herculase DNA Polymerase

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>Product/ingredient name</th>
<th>Exposure limit values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase DNA Polymerase</td>
<td>EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m³ 8 hours. Form: Mist</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
</tr>
</tbody>
</table>

**Recommended monitoring procedures**

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

**DNELs/DMELs**

No DNELs/DMELs available.

**PNECs**

No PNECs available

8.2 Exposure controls

**Appropriate engineering controls**

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

**Individual protection measures**

**Hygiene measures**

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

**Eye/face protection**

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

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**SECTION 8: Exposure controls/personal protection**

**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.

**Environmental exposure controls**: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**SECTION 9: Physical and chemical properties**

**9.1 Information on basic physical and chemical properties**

**Appearance**

- **Physical state**
  - DMSO: Liquid. [Clear.]
  - 10X Herculase Reaction Buffer: Liquid.
  - Herculase DNA Polymerase: Liquid.

- **Colour**
  - DMSO: Colourless.
  - 10X Herculase Reaction Buffer: Not available.
  - Herculase DNA Polymerase: Not available.

- **Odour**
  - DMSO: Odourless. [Slight]
  - 10X Herculase Reaction Buffer: Not available.
  - Herculase DNA Polymerase: Not available.

- **Odour threshold**
  - DMSO: Not available.
  - 10X Herculase Reaction Buffer: Not available.
  - Herculase DNA Polymerase: Not available.

- **pH**
  - DMSO: Not available. 9.1
  - 10X Herculase Reaction Buffer: 8
  - Herculase DNA Polymerase: Not available.

- **Melting point/freezing point**
  - DMSO: 18.5°C
  - 10X Herculase Reaction Buffer: Not available.
  - Herculase DNA Polymerase: Not available.

- **Initial boiling point and boiling range**
  - DMSO: 189°C
  - 10X Herculase Reaction Buffer: Not available.
  - Herculase DNA Polymerase: Not available.
**SECTION 9: Physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>DMSO</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
<th>Herculase DNA Polymerase</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
<th>10X Herculase Reaction Buffer</th>
<th>Herculase DNA Polymerase</th>
</tr>
</thead>
</table>
Herculase Enhanced DNA Polymerase, Part Number 600262

SECTION 9: Physical and chemical properties

Viscosity:
- DMSO
  - Dynamic (room temperature): 2.14 mPa·s
- 10X Herculase Reaction Buffer: Not available.
- Herculase DNA Polymerase: Not available.

Explosive properties:
- DMSO: Not available.
- 10X Herculase Reaction Buffer: Not available.
- Herculase DNA Polymerase: Not available.

Oxidising properties:
- DMSO: Not available.
- 10X Herculase Reaction Buffer: Not available.
- Herculase DNA Polymerase: Not available.

9.2 Other information
No additional information.

SECTION 10: Stability and reactivity

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

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

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

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

10.5 Incompatible materials:
- DMSO: May react or be incompatible with oxidising materials.
- 10X Herculase Reaction Buffer: May react or be incompatible with oxidising materials.
- Herculase DNA Polymerase: May react or be incompatible with oxidising materials.

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SECTION 10: Stability and reactivity

10.6 Hazardous decomposition products

- DMSO: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- 10X Herculase Reaction Buffer: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Herculase DNA Polymerase: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>40000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>14500 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2800 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>DMSO</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams 100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams 100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams 100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams 100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>Eyes - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>1%</td>
<td>-</td>
</tr>
</tbody>
</table>

Sensitiser

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 likely routes of exposure

- DMSO: Routes of entry anticipated: Oral, Dermal, Inhalation.
- 10X Herculase Reaction Buffer: Not available.
- Herculase DNA Polymerase: Routes of entry anticipated: Oral, Dermal, Inhalation.

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SECTION 11: Toxicological information

Potential acute health effects

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

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

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

Eye contact:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:
- DMSO: No specific data.
- 10X Herculase Reaction Buffer: No specific data.
- Herculase DNA Polymerase: No specific data.

Ingestion:
- DMSO: No specific data.
- 10X Herculase Reaction Buffer: No specific data.
- Herculase DNA Polymerase: No specific data.

Skin contact:
- DMSO: No specific data.
- 10X Herculase Reaction Buffer: No specific data.
- Herculase DNA Polymerase: No specific data.

Eye contact:
- DMSO: No specific data.
- 10X Herculase Reaction Buffer: No specific data.
- Herculase DNA Polymerase: No specific data.

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

Short term exposure:
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Long term exposure:
- Potential immediate effects: Not available.
- Potential delayed effects: Not available.

Potential chronic health effects

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SECTION 11: Toxicological information

General:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: No known significant effects or critical hazards.

Carcinogenicity:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: No known significant effects or critical hazards.

Mutagenicity:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: No known significant effects or critical hazards.

Teratogenicity:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: No known significant effects or critical hazards.

Developmental effects:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: No known significant effects or critical hazards.

Fertility effects:
- DMSO: No known significant effects or critical hazards.
- 10X Herculase Reaction Buffer: No known significant effects or critical hazards.
- Herculase DNA Polymerase: 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>DMSO Dimethyl sulfoxide</td>
<td>Acute LC50 25000 ppm Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 34000000 μg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 100 ul/L Marine water</td>
<td>Algae - Ulva lactuca</td>
<td>72 hours</td>
</tr>
<tr>
<td>Herculase DNA Polymerase</td>
<td>Acute EC50 210 μg/l Fresh water</td>
<td>Algae - Pseudokirchneriella subcapitata</td>
<td>96 hours</td>
</tr>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-</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 to 9800 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>
</tbody>
</table>

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

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SECTION 12: Ecological information

<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>Dimethyl sulfoxide</td>
<td>-1.35</td>
<td>3.16</td>
<td>low</td>
</tr>
<tr>
<td>Herculase DNA Polymerase Poly(oxy-1,2-ethanediyl), .alpha.-([1,1,3,3-tetramethylbutyl]phenyl) .omega.-hydroxy-</td>
<td>3.77</td>
<td>78.67</td>
<td>low</td>
</tr>
</tbody>
</table>

12.4 Mobility in soil

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

12.5 Results of PBT and vPvB assessment

- PBT: Not applicable.
- vPvB: Not applicable.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

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

**Packaging**

Methods of disposal: The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions: This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

ADR/RID / IMDG / IATA: Not regulated.

14.6 Special precautions for user: Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code: Not available.

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SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV
None of the components are listed.

Substances of very high concern

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Intrinsic property</th>
<th>Status</th>
<th>Reference number</th>
<th>Date of revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase DNA Polymerase</td>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-</td>
<td>Substance of equivalent concern for environment</td>
<td>Recommended</td>
<td>ED/169/2012</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Substances of equivalent concern for environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance of equivalent concern for environment</td>
</tr>
<tr>
<td>Recommended</td>
</tr>
<tr>
<td>ED/169/2012</td>
</tr>
<tr>
<td>2/10/2014</td>
</tr>
</tbody>
</table>

Other EU regulations

Industrial emissions (integrated pollution prevention and control) - Air

Ozone depleting substances (1005/2009/EU)
Not listed.

Prior Informed Consent (PIC) (649/2012/EU)
Not listed.

Seveso Directive
This product is not controlled under the Seveso Directive.

International regulations

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

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

Stockholm Convention on Persistent Organic Pollutants
Not listed.

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

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

Inventory list

Australia: All components are listed or exempted.
Canada: All components are listed or exempted.
China: All components are listed or exempted.
Europe: All components are listed or exempted.
Japan: Japan inventory (ENCS): Not determined.
           Japan inventory (ISHL): Not determined.

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SECTION 15: Regulatory information

Malaysia : Not determined.
New Zealand : All components are listed or exempted.
Philippines : Not determined.
Republic of Korea : Not determined.
Taiwan : All components are listed or exempted.
Thailand : Not determined.
Turkey : Not determined.
United States : All components are listed or exempted.
Viet Nam : Not determined.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

Abbreviations and acronyms:
- ATE = Acute Toxicity Estimate
- CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
- DNEL = Derived No Effect Level
- EUH statement = CLP-specific Hazard statement
- PNEC = Predicted No Effect Concentration
- RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified.</td>
<td></td>
</tr>
</tbody>
</table>

Full text of abbreviated H statements

Herculase DNA Polymerase
- H315 : Causes skin irritation.
- H318 : Causes serious eye damage.
- H411 : Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

Herculase DNA Polymerase
- Aquatic Chronic 2, H411 : LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
- Eye Dam. 1, H318 : SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
- Skin Irrit. 2, H315 : SKIN CORROSION/IRRITATION - Category 2

Date of issue/ Date of revision : 25/05/2017
Date of previous issue : 30/09/2016
Version : 2

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