SAFETY DATA SHEET
Herculase II Fusion Enzyme with dNTPs Combo, Part Number 600679

Section 1. Identification

<table>
<thead>
<tr>
<th>Product identifier</th>
<th>Herculase II Fusion Enzyme with dNTPs Combo, Part Number 600679</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no. (chemical kit)</td>
<td>600679</td>
</tr>
<tr>
<td>Part no.</td>
<td>DMSO 600260-53, Herculase II Fusion DNA Polymerase 600679-51, 5X Herculase II Reaction Buffer 600675-52, 100 mM dNTP Mix (25 mM each dNTP) 200418-51</td>
</tr>
</tbody>
</table>

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

Material uses: Analytical reagent.

<table>
<thead>
<tr>
<th>Material uses</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>1 ml</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>40 µl (400 reactions)</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>4 x 1.5 ml</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>2 x 100 µl</td>
</tr>
</tbody>
</table>

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

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

Section 2. Hazard(s) identification

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Substance</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>H227 FLAMMABLE LIQUIDS - Category 4</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>H401 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>30 - 60%</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>1 - 10%</td>
</tr>
</tbody>
</table>

GHS label elements

Date of issue/Date of revision: 26/04/2018
Date of previous issue: 21/06/2017
Version: 6
## Section 2. Hazard(s) identification

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Hazard statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td><strong>H227</strong> - Combustible liquid.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>H401 - Toxic to aquatic life.</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

### Precautionary statements

#### Prevention

| **DMSO** | P280 - Wear protective gloves. Wear eye or face protection. |
| Herculase II Fusion DNA Polymerase | P210 - Keep away from flames and hot surfaces. -No smoking. |
| 5X Herculase II Reaction Buffer | P273 - Avoid release to the environment. |
| 100 mM dNTP Mix (25 mM each dNTP) | Not applicable. |

#### Response

| **DMSO** | Not applicable. |
| Herculase II Fusion DNA Polymerase | Not applicable. |
| 5X Herculase II Reaction Buffer | Not applicable. |
| 100 mM dNTP Mix (25 mM each dNTP) | Not applicable. |

#### Storage

| **DMSO** | P403 - Store in a well-ventilated place. |
| Herculase II Fusion DNA Polymerase | P235 - Keep cool. |
| 5X Herculase II Reaction Buffer | Not applicable. |
| 100 mM dNTP Mix (25 mM each dNTP) | Not applicable. |

#### Disposal

| **DMSO** | P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| Herculase II Fusion DNA Polymerase | Not applicable. |
| 5X Herculase II Reaction Buffer | P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| 100 mM dNTP Mix (25 mM each dNTP) | Not applicable. |

### Supplemental label elements

#### Additional warning phrases

| **DMSO** | Not applicable. |
| Herculase II Fusion DNA Polymerase | Not applicable. |
| 5X Herculase II Reaction Buffer | Not applicable. |
| 100 mM dNTP Mix (25 mM each dNTP) | Not applicable. |
Section 2. Hazard(s) identification

Other hazards which do not result in classification:
- DMSO: None known.
- Herculase II Fusion DNA Polymerase: None known.
- 5X Herculase II Reaction Buffer: None known.
- 100 mM dNTP Mix (25 mM each dNTP): None known.

Section 3. Composition and ingredient information

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>Ingredient name</th>
<th>% (w/w)</th>
<th>CAS number/other identifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>Dimethyl sulfoxide</td>
<td>100</td>
<td>67-68-5</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
<td>≥30 - ≤60</td>
<td>56-81-5</td>
</tr>
<tr>
<td></td>
<td>Glycerol</td>
<td>&lt;2.5</td>
<td>7783-20-2</td>
</tr>
</tbody>
</table>

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

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

Section 4. First aid measures

Description of necessary first aid measures

Eye contact:
- DMSO: 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 if irritation occurs.
- Herculase II Fusion 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.
- 5X Herculase II Reaction Buffer: 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 if irritation occurs.
- 100 mM dNTP Mix (25 mM each dNTP): 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.
## Section 4. First aid measures

<table>
<thead>
<tr>
<th><strong>Inhalation</strong></th>
<th><strong>DMSO</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></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><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></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>
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<table>
<thead>
<tr>
<th><strong>Skin contact</strong></th>
<th><strong>DMSO</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Remove 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><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Flush contaminated skin with plenty of water.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Flush contaminated skin with plenty of water.</td>
</tr>
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<tr>
<th><strong>Ingestion</strong></th>
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<tr>
<td><strong>Wash out mouth with water.</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td></td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
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### Section 4. First aid measures

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<th>First Aid Measures</th>
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<tr>
<td>Herculase II Fusion DNA Polymerase</td>
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<td>100 mM dNTP Mix (25 mM each dNTP)</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>
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### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- **Eye contact**: DMSO
  - **Herculase II Fusion DNA Polymerase**: No known significant effects or critical hazards.
  - **5X Herculase II Reaction Buffer**: No known significant effects or critical hazards.
  - **100 mM dNTP Mix (25 mM each dNTP)**: No known significant effects or critical hazards.

- **Inhalation**: DMSO
  - **Herculase II Fusion DNA Polymerase**: No known significant effects or critical hazards.
  - **5X Herculase II Reaction Buffer**: No known significant effects or critical hazards.
  - **100 mM dNTP Mix (25 mM each dNTP)**: No known significant effects or critical hazards.

- **Skin contact**: DMSO
  - **Herculase II Fusion DNA Polymerase**: No known significant effects or critical hazards.
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Section 4. First aid measures

Ingestion

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<tr>
<th>Substance</th>
<th>Notes to physician</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No known significant effects or critical hazards.</td>
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Over-exposure signs/symptoms

Eye contact

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No specific data.</td>
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<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>No specific data.</td>
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<td>100 mM dNTP Mix (25 mM each dNTP)</td>
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Inhalation

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Skin contact

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<td>Herculase II Fusion DNA Polymerase</td>
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</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
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</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
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Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific treatments</th>
</tr>
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<tbody>
<tr>
<td>DMSO</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
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<td>5X Herculase II Reaction Buffer</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>
</tr>
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<td>100 mM dNTP Mix (25 mM each dNTP)</td>
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Specific treatments

<table>
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<td>DMSO</td>
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<td>Herculase II Fusion DNA Polymerase</td>
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<td>5X Herculase II Reaction Buffer</td>
<td>No specific treatment.</td>
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<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No specific treatment.</td>
</tr>
</tbody>
</table>
Section 4. First aid measures

Protection of first-aiders:

- **DMSO**: 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.
- **Herculase II Fusion DNA Polymerase**: No action shall be taken involving any personal risk or without suitable training.
- **5X Herculase II Reaction Buffer**: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- **100 mM dNTP Mix (25 mM each dNTP)**: No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Firefighting measures

**Extinguishing media**

- **Suitable extinguishing media**:
  - **DMSO**: Use dry chemical, \( \text{CO}_2 \), water spray (fog) or foam.
  - **Herculase II Fusion DNA Polymerase**: Use an extinguishing agent suitable for the surrounding fire.
  - **5X Herculase II Reaction Buffer**: Use an extinguishing agent suitable for the surrounding fire.
  - **100 mM dNTP Mix (25 mM each dNTP)**: Use an extinguishing agent suitable for the surrounding fire.

- **Unsuitable extinguishing media**:
  - **DMSO**: Do not use water jet.
  - **Herculase II Fusion DNA Polymerase**: None known.
  - **5X Herculase II Reaction Buffer**: None known.
  - **100 mM dNTP Mix (25 mM each dNTP)**: None known.

**Specific hazards arising from the chemical**

- **DMSO**: Combustible liquid. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.
  - **Herculase II Fusion DNA Polymerase**: In a fire or if heated, a pressure increase will occur and the container may burst.
  - **5X Herculase II Reaction Buffer**: In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
  - **100 mM dNTP Mix (25 mM each dNTP)**: In a fire or if heated, a pressure increase will occur and the container may burst.

**Hazardous thermal decomposition products**

- **DMSO**: Decomposition products may include the following materials:
  - Carbon dioxide
  - Carbon monoxide
  - Sulfur oxides

- **Herculase II Fusion DNA Polymerase**: Decomposition products may include the following materials:
  - Carbon dioxide
  - Carbon monoxide

- **5X Herculase II Reaction Buffer**: Decomposition products may include the following materials:
  - Carbon dioxide
Section 5. Firefighting measures

Special protective actions for fire-fighters:

- **DMSO**: 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. Use water spray to keep fire-exposed containers cool.

- **Herculase II Fusion DNA Polymerase**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

- **5X Herculase II Reaction Buffer**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

- **100 mM dNTP Mix (25 mM each dNTP)**: 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:

- **DMSO**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

- **Herculase II Fusion 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.

- **5X Herculase II 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.

- **100 mM dNTP Mix (25 mM each dNTP)**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

- **DMSO**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Do not touch or walk through spill material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

- **Herculase II Fusion DNA Polymerase**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Do not touch or walk through spill material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Section 6. Accidental release measures

### Environmental precautions

- **5X Herculase II Reaction Buffer**
  - No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

- **100 mM dNTP Mix (25 mM each dNTP)**
  - No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

### For emergency responders

- **DMSO**
  - If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- **Herculase II Fusion DNA Polymerase**
  - If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- **5X Herculase II Reaction Buffer**
  - If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- **100 mM dNTP Mix (25 mM each dNTP)**
  - If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

### Methods and material for containment and cleaning up

- **DMSO**
  - 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).

- **Herculase II Fusion DNA Polymerase**
  - Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

- **5X Herculase II Reaction Buffer**
  - Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

- **100 mM dNTP Mix (25 mM each dNTP)**
  - 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).
Section 6. Accidental release measures

Methods for cleaning up:

- **Herculase II Fusion Enzyme with dNTPs Combo**, Part Number 600679
  - Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. 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.

- **Herculase II Fusion DNA Polymerase**
  - Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

- **5X Herculase II 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.

- **100 mM dNTP Mix (25 mM each dNTP)**
  - Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling:

- **Protective measures**: DMSO
  - Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

- **Herculase II Fusion DNA Polymerase**
  - Put on appropriate personal protective equipment (see Section 8).

- **5X Herculase II Reaction Buffer**
  - Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. 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.

- **100 mM dNTP Mix (25 mM each dNTP)**
  - 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.
Section 7. Handling and storage

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>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.</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>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.</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Conditions for safe storage, including any incompatibilities**

- **Herculase II Fusion DNA Polymerase**: Storage temperature: -20°C (-4°F). Store in a segregated and approved area. 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. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

- **5X Herculase II 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.

- **100 mM dNTP Mix (25 mM each dNTP)**: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Section 7. Handling and storage

Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls and personal protection

### Control parameters

### Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td><strong>DFG MAC-values list (Germany, 7/2017). Absorbed through skin.</strong></td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>PEAK: 320 mg/m³, 4 times per shift, 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>TWA: 160 mg/m³ 8 hours.</td>
</tr>
<tr>
<td></td>
<td>PEAK: 100 ppm, 4 times per shift, 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>TWA: 50 ppm 8 hours.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td><strong>Safe Work Australia (Australia, 1/2014).</strong></td>
</tr>
<tr>
<td>Glycerol</td>
<td>TWA: 10 mg/m³ 8 hours.</td>
</tr>
</tbody>
</table>

### Appropriate engineering controls

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

### Environmental exposure controls

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

### Individual protection measures

#### Hygiene measures

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

#### Eye/face protection

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

#### Skin 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.

#### 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.
### Section 8. Exposure controls and personal protection

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

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

### Section 9. Physical and chemical properties

#### Appearance

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>Liquid. [Clear.]</td>
<td>Liquid.</td>
<td>Liquid.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Liquid.</td>
<td>Liquid.</td>
<td>Liquid.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Liquid.</td>
<td>Liquid.</td>
<td>Liquid.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Liquid.</td>
<td>Liquid.</td>
<td>Liquid.</td>
</tr>
</tbody>
</table>

#### Colour

<table>
<thead>
<tr>
<th>Colour</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>Colourless.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

#### Odour

<table>
<thead>
<tr>
<th>Odour</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>Odourless. [Slight]</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

#### Odour threshold

<table>
<thead>
<tr>
<th>Odour threshold</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

#### pH

<table>
<thead>
<tr>
<th>pH</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>8.2</td>
<td>9.5 to 10.5</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

#### Melting point

<table>
<thead>
<tr>
<th>Melting point</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>18.5°C (65.3°F)</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

#### Boiling point

<table>
<thead>
<tr>
<th>Boiling point</th>
<th>Herculase II Fusion DNA Polymerase</th>
<th>5X Herculase II Reaction Buffer</th>
<th>100 mM dNTP Mix (25 mM each dNTP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DMSO</strong></td>
<td>189°C (372.2°F)</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Herculase II Fusion DNA Polymerase</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>5X Herculase II Reaction Buffer</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>100 mM dNTP Mix (25 mM each dNTP)</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>
Section 9. Physical and chemical properties

**Flash point**
- **DMSO**: Closed cup: 87°C (188.6°F)  
  Open cup: 87°C (188.6°F)  
  Not available.  
- **Herculase II Fusion DNA Polymerase**: Not available.  
- **5X Herculase II Reaction Buffer**: Not available.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not available.

**Evaporation rate**
- **DMSO**: 0.026 (butyl acetate = 1)  
  Not available.  
- **Herculase II Fusion DNA Polymerase**: Not available.  
- **5X Herculase II Reaction Buffer**: Not available.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not available.

**Flammability (solid, gas)**
- **DMSO**: Not applicable.  
  Not applicable.  
- **Herculase II Fusion DNA Polymerase**: Not applicable.  
- **5X Herculase II Reaction Buffer**: Not applicable.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not applicable.

**Lower and upper explosive (flammable) limits**
- **DMSO**: Lower: 2.6%  
  Upper: 28.5%  
  Not available.  
- **Herculase II Fusion DNA Polymerase**: Not available.  
- **5X Herculase II Reaction Buffer**: Not available.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not available.

**Vapour pressure**
- **DMSO**: 0.056 kPa (0.42 mm Hg) [room temperature]  
  Not available.  
- **Herculase II Fusion DNA Polymerase**: Not available.  
- **5X Herculase II Reaction Buffer**: Not available.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not available.

**Vapour density**
- **DMSO**: 2.7 [Air = 1]  
  Not available.  
- **Herculase II Fusion DNA Polymerase**: Not available.  
- **5X Herculase II Reaction Buffer**: Not available.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not available.

**Relative density**
- **DMSO**: 1.1  
  Not available.  
- **Herculase II Fusion DNA Polymerase**: Not available.  
- **5X Herculase II Reaction Buffer**: Not available.  
- **100 mM dNTP Mix (25 mM each dNTP)**: Not available.

**Solubility**
- **DMSO**: Easily soluble in the following materials: cold water and hot water.  
  Soluble in the following materials: cold water and hot water.  
  Easily soluble in the following materials: cold water and hot water.  
  Easily soluble in the following materials: cold water and hot water.
# Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>DMSO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>DMSO</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>DMSO</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>DMSO</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
</tbody>
</table>

# Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>DMSO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reactivity</strong></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
<tr>
<td><strong>Chemical stability</strong></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
<tr>
<td><strong>Possibility of hazardous reactions</strong></td>
<td>Herculase II Fusion DNA Polymerase</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
</tr>
</tbody>
</table>
## Section 10. Stability and reactivity

### Conditions to avoid

<table>
<thead>
<tr>
<th>Substance</th>
<th>Avoidancecedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapour to accumulate in low or confined areas.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No specific data.</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

### Incompatible materials

- Reactive or incompatible with the following materials: oxidizing materials
- May react or be incompatible with oxidising materials.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>Reactive or incompatible with oxidizing materials</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>May react or be incompatible with oxidising materials</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>May react or be incompatible with oxidising materials</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>May react or be incompatible with oxidising materials</td>
</tr>
</tbody>
</table>

### Hazardous decomposition products

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

<table>
<thead>
<tr>
<th>Substance</th>
<th>Decomposition products</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
</tbody>
</table>

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 II Fusion DNA Polymerase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</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></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 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</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>100 milligrams</td>
<td>-</td>
</tr>
</tbody>
</table>

**Date of issue/Date of revision**: 26/04/2018

**Date of previous issue**: 21/06/2017

**Version**: 6
Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Herculase II Fusion DNA Polymerase</th>
<th>Glycerol</th>
<th>Eyes - Mild irritant</th>
<th>Rabbit</th>
<th>-</th>
<th>24 hours 500 milligrams</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
</tbody>
</table>

**Sensitisation**
No 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 likely routes of exposure**

**DMSO**
Herculase II Fusion DNA Polymerase
5X Herculase II Reaction Buffer
100 mM dNTP Mix (25 mM each dNTP)
Routess of entry anticipated: Oral, Dermal, Inhalation.

Not available.

**Potential acute health effects**

**Eye contact**

**DMSO**
Herculase II Fusion DNA Polymerase
5X Herculase II Reaction Buffer
100 mM dNTP Mix (25 mM each dNTP)
No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Inhalation**

**DMSO**
Herculase II Fusion DNA Polymerase
5X Herculase II Reaction Buffer
100 mM dNTP Mix (25 mM each dNTP)
No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Skin contact**

**DMSO**
Herculase II Fusion DNA Polymerase
5X Herculase II Reaction Buffer
100 mM dNTP Mix (25 mM each dNTP)
No known significant effects or critical hazards.

No known significant effects or critical hazards.

**Date of issue/Date of revision**: 26/04/2018
**Date of previous issue**: 21/06/2017
**Version**: 6
## Section 11. Toxicological information

### Ingestion

<table>
<thead>
<tr>
<th>Compound</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mode of Exposure</th>
<th>Compound</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion</td>
<td>DMSO</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>DMSO</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>DMSO</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>Herculase II Fusion DNA Polymerase</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>5X Herculase II Reaction Buffer</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>100 mM dNTP Mix (25 mM each dNTP)</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

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

**Short term exposure**

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

**Long term exposure**

- **Potential immediate effects**: Not available.
- **Potential delayed effects**: Not available.

**Potential chronic health effects**

- **General**: No known significant effects or critical hazards.
Section 11. Toxicological information

Carcinogenicity:
- DMSO: No known significant effects or critical hazards.
- Herculase II Fusion DNA Polymerase: No known significant effects or critical hazards.
- 5X Herculase II Reaction Buffer: No known significant effects or critical hazards.
- 100 mM dNTP Mix (25 mM each dNTP): No known significant effects or critical hazards.

Mutagenicity:
- DMSO: No known significant effects or critical hazards.
- Herculase II Fusion DNA Polymerase: No known significant effects or critical hazards.
- 5X Herculase II Reaction Buffer: No known significant effects or critical hazards.
- 100 mM dNTP Mix (25 mM each dNTP): No known significant effects or critical hazards.

Teratogenicity:
- DMSO: No known significant effects or critical hazards.
- Herculase II Fusion DNA Polymerase: No known significant effects or critical hazards.
- 5X Herculase II Reaction Buffer: No known significant effects or critical hazards.
- 100 mM dNTP Mix (25 mM each dNTP): No known significant effects or critical hazards.

Developmental effects:
- DMSO: No known significant effects or critical hazards.
- Herculase II Fusion DNA Polymerase: No known significant effects or critical hazards.
- 5X Herculase II Reaction Buffer: No known significant effects or critical hazards.
- 100 mM dNTP Mix (25 mM each dNTP): No known significant effects or critical hazards.

Fertility effects:
- DMSO: No known significant effects or critical hazards.
- Herculase II Fusion DNA Polymerase: No known significant effects or critical hazards.
- 5X Herculase II Reaction Buffer: No known significant effects or critical hazards.
- 100 mM dNTP Mix (25 mM each dNTP): No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates
- Not available.

Section 12. Ecological information

Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO Dimethyl suloxide</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 Chronic NOEC 100 ul/L Marine water</td>
<td>Fish - Pimephales promelas Algae - Ulva lactuca</td>
<td>96 hours 72 hours</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase Glycerol</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer Ammonium sulphate</td>
<td>Acute LC50 2.6 mg/l Fresh water</td>
<td>Crustaceans - Ceriodaphnia</td>
<td>48 hours</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

<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>Herculase II Fusion DNA Polymerase</td>
<td>301D Ready Biodegradability - Closed Bottle Test</td>
<td>93 % - 30 days</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>-</td>
<td>-</td>
<td>Readily</td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>5X Herculase II Reaction Buffer</td>
<td></td>
<td></td>
<td>Readily</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

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>DMSO</td>
<td>-1.35</td>
<td>3.16</td>
<td>low</td>
</tr>
<tr>
<td>Herculase II Fusion DNA Polymerase Glycerol</td>
<td>-1.76</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer Ammonium sulphate</td>
<td>-5.1</td>
<td>-</td>
<td>low</td>
</tr>
</tbody>
</table>

Mobility in soil

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

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

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.
Section 14. Transport information

**ADG / IMDG / IATA**
Not regulated as Dangerous Goods according to the ADG Code.

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

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

Section 15. Regulatory information

**Standard Uniform Schedule of Medicine and Poisons**
6

**Model Work Health and Safety Regulations - Scheduled Substances**
No listed substance

**International regulations**

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

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

- **Stockholm Convention on Persistent Organic Pollutants**
  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**
  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.

- **Thailand**
  Not determined.

- **Turkey**
  Not determined.

- **United States**
  Not determined.

- **Viet Nam**
  Not determined.
Herculase II Fusion Enzyme with dNTPs Combo, Part Number 600679

Section 16. Any other relevant information

History

Date of issue/Date of revision : 26/04/2018
Date of previous issue : 21/06/2017
Version : 6

Key to abbreviations

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

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO Flam. Liq. 4, H227</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>5X Herculase II Reaction Buffer Aquatic Acute 2, H401</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

References : Not available.

(sequence of items as indicated)

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