Section 1. Identification

1.1 Product identifier
Product name: Herculase II Fusion DNA Polymerase, 30,000 Reaction Kit, Part Number 930689
Part no. (chemical kit): 930689
Part no.: DMSO 930689-54
Herculase II Fusion Enzyme 30,0000 rxn 930689-51
Herculase II 5X Rxn Buffer 930689-52
dNTPs 100mM 930689-53

Validation date: 10/18/2018

1.2 Relevant identified uses of the substance or mixture and uses advised against
Material uses: Analytical reagent.
DMSO 2 x 37.5 ml
Herculase II Fusion Enzyme 30,0000 rxn 1 x 30 ml (30,000 reactions)
Herculase II 5X Rxn Buffer 9 x 50 ml
dNTPs 100mM 1 x 15 ml

1.3 Details of the supplier of the safety data sheet
Supplier/Manufacturer: Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

1.4 Emergency telephone number
In case of emergency: CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture
OSHA/HCS status: DMSO
H227 FLAMMABLE LIQUIDS - Category 4
H320 EYE IRRITATION - Category 2B
H402 AQUATIC HAZARD (ACUTE) - Category 3
H412 AQUATIC HAZARD (LONG-TERM) - Category 3

Herculase II Fusion Enzyme 30,0000 rxn
H320 EYE IRRITATION - Category 2B

Classification of the substance or mixture
DMSO
H227 FLAMMABLE LIQUIDS - Category 4
H320 EYE IRRITATION - Category 2B
H402 AQUATIC HAZARD (ACUTE) - Category 3
H412 AQUATIC HAZARD (LONG-TERM) - Category 3

Herculase II Fusion Enzyme 30,0000 rxn
H320 EYE IRRITATION - Category 2B

Date of issue : 10/18/2018
Section 2. Hazards identification

Herculase II Fusion DNA Polymerase, 30,000 Reaction Kit, Part Number 930689

2.2 GHS label elements

**Ingredients of unknown toxicity**

- **Herculase II Fusion Enzyme 30,000 rxn**
  - Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%
- **Herculase II 5X Rxn Buffer**
  - Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%
- **dNTPs 100mM**
  - Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 1 - 10%

**Signal word**: DMSO

- Warning

**Hazard statements**

- **DMSO**
  - H227 - Combustible liquid.
  - H320 - Causes eye irritation.
  - H412 - Harmful to aquatic life with long lasting effects.
- **Herculase II Fusion Enzyme 30,000 rxn**
  - H320 - Causes eye irritation.
- **Herculase II 5X Rxn Buffer**
  - H401 - Toxic to aquatic life.
- **dNTPs 100mM**
  - No known significant effects or critical hazards.

**Precautionary statements**

**Prevention**

- **DMSO**
  - P280 - Wear protective gloves. Wear eye or face protection.
  - P210 - Keep away from flames and hot surfaces. - No smoking.
  - P273 - Avoid release to the environment.
  - P264 - Wash hands thoroughly after handling.
  - **Herculase II Fusion Enzyme 30,000 rxn**
  - P273 - Avoid release to the environment.
  - Not applicable.

**Response**

- **DMSO**
  - P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P337 + P313 - If eye irritation persists: Get medical attention.
  - **Herculase II Fusion Enzyme 30,000 rxn**
  - P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P337 + P313 - If eye irritation persists: Get medical attention.
  - **Herculase II 5X Rxn Buffer**
  - Not applicable.

**Date of issue**: 10/18/2018
Section 2. Hazards identification

Storage:
- dNTPs 100mM: Not applicable.
- DMSO: P403 - Store in a well-ventilated place. P235 - Keep cool.
- Herculase II Fusion Enzyme 30,000 rxn: Not applicable.
- Herculase II 5X Rxn Buffer: Not applicable.
- dNTPs 100mM: Not applicable.

Disposal:
- DMSO: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Herculase II Fusion Enzyme 30,000 rxn: Not applicable.
- Herculase II 5X Rxn Buffer: Not applicable.
- dNTPs 100mM: Not applicable.

Supplemental label elements:
- DMSO: None known.
- Herculase II Fusion Enzyme 30,000 rxn: None known.
- Herculase II 5X Rxn Buffer: None known.
- dNTPs 100mM: None known.

2.3 Other hazards

Hazards not otherwise classified:
- DMSO: None known.
- Herculase II Fusion Enzyme 30,000 rxn: None known.
- Herculase II 5X Rxn Buffer: None known.
- dNTPs 100mM: None known.

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>100</td>
<td>67-68-5</td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥50 - ≤75</td>
<td>56-81-5</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trometamol</td>
<td>≤3</td>
<td>77-86-1</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>≤2.5</td>
<td>7783-20-2</td>
</tr>
<tr>
<td>Hexadecan-1-ol, ethoxylated</td>
<td>≤3</td>
<td>9004-95-9</td>
</tr>
</tbody>
</table>

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

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

Occupational exposure limits, if available, are listed in Section 8.
### 4.1 Description of necessary first aid measures

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>DMSO</td>
</tr>
<tr>
<td></td>
<td>Immediately flush eyes with plenty of water, occasionally lifting the upper</td>
</tr>
<tr>
<td></td>
<td>and lower eyelids. Check for and remove any contact lenses. Continue to</td>
</tr>
<tr>
<td></td>
<td>rinse for at least 10 minutes. If irritation persists, get medical attention.</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.</td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Immediately flush eyes with plenty of water, occasionally lifting the upper</td>
</tr>
<tr>
<td></td>
<td>and lower eyelids. Check for and remove any contact lenses. Get medical</td>
</tr>
<tr>
<td></td>
<td>attention if irritation occurs.</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>DMSO</td>
</tr>
<tr>
<td></td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for</td>
</tr>
<tr>
<td></td>
<td>breathing. If not breathing, if breathing is irregular or if respiratory</td>
</tr>
<tr>
<td></td>
<td>arrest occurs, provide artificial respiration or oxygen by trained personnel.</td>
</tr>
<tr>
<td></td>
<td>It may be dangerous to the person providing aid to give mouth-to-mouth</td>
</tr>
<tr>
<td></td>
<td>resuscitation. Get medical attention if adverse health effects persist or are</td>
</tr>
<tr>
<td></td>
<td>severe. If unconscious, place in recovery position and get medical attention</td>
</tr>
<tr>
<td></td>
<td>immediately. Maintain an open airway. Loosen tight clothing such as a collar,</td>
</tr>
<tr>
<td></td>
<td>tie, belt or waistband.</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</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>Herculase II 5X Rxn Buffer</td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need medical attention immediately.</td>
</tr>
</tbody>
</table>
Section 4. First aid measures

**dNTPs 100mM**

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.

**Skin contact**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**DMSO**

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Herculase II Fusion Enzyme 30,0000 rxn**

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**Herculase II 5X Rxn Buffer**

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**dNTPs 100mM**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Herculase II Fusion Enzyme 30,000 rxn**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**dNTPs 100mM**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

**Herculase II Fusion Enzyme 30,000 rxn**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**dNTPs 100mM**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

**Herculase II Fusion Enzyme 30,000 rxn**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Section 4. First aid measures

Herculase II 5X Rxn Buffer
Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

dNTPs 100mM
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.

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact
- DMSO
  - Herculase II Fusion Enzyme 30,000 rxn
  - Herculase II 5X Rxn Buffer
  - dNTPs 100mM
  - Causes eye irritation.

Inhalation
- DMSO
  - Herculase II Fusion Enzyme 30,000 rxn
  - Herculase II 5X Rxn Buffer
  - dNTPs 100mM
  - No known significant effects or critical hazards.

Skin contact
- DMSO
  - Herculase II Fusion Enzyme 30,000 rxn
  - Herculase II 5X Rxn Buffer
  - dNTPs 100mM
  - No known significant effects or critical hazards.

Ingestion
- DMSO
  - Herculase II Fusion Enzyme 30,000 rxn
  - Herculase II 5X Rxn Buffer
  - dNTPs 100mM
  - No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact
- DMSO
  - Herculase II Fusion Enzyme 30,000 rxn
  - Adverse symptoms may include the following:
    - irritation
    - watering
    - redness

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Section 4. First aid measures

<table>
<thead>
<tr>
<th>Substance</th>
<th>Skin contact</th>
<th>Ingestion</th>
<th>Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

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

Notes to physician:

- DMSO: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Herculase II Fusion Enzyme 30,000 rxn: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Herculase II 5X Rxn Buffer: 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.
- dNTPs 100mM: In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments:

- DMSO: No specific treatment.
- Herculase II Fusion Enzyme 30,000 rxn: No specific treatment.
- Herculase II 5X Rxn Buffer: No specific treatment.
- dNTPs 100mM: No specific treatment.

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 Enzyme 30,000 rxn: 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 5X Rxn 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.
- dNTPs 100mM: No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)
# Section 5. Fire-fighting measures

## 5.1 Extinguishing media

<table>
<thead>
<tr>
<th>Suitable extinguishing media</th>
<th>DMSO</th>
<th>Herculase II Fusion Enzyme 30,000 rxn</th>
<th>Use dry chemical, CO₂, water spray (fog) or foam.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dNTPs 100mM</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unsuitable extinguishing media</th>
<th>DMSO</th>
<th>Herculase II Fusion Enzyme 30,000 rxn</th>
<th>Do not use water jet.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Herculase II 5X Rxn Buffer</td>
<td>None known.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dNTPs 100mM</td>
<td>None known.</td>
</tr>
</tbody>
</table>

## 5.2 Special hazards arising from the substance or mixture

<table>
<thead>
<tr>
<th>Specific hazards arising from the chemical</th>
<th>DMSO</th>
<th>Herculase II Fusion Enzyme 30,000 rxn</th>
<th>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 vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Herculase II 5X Rxn Buffer</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dNTPs 100mM</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous thermal decomposition products</th>
<th>DMSO</th>
<th>Herculase II Fusion Enzyme 30,000 rxn</th>
<th>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dNTPs 100mM</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, metal oxide/oxides</td>
</tr>
</tbody>
</table>

| dNTPs 100mM | Decomposition products may include the following materials: carbon dioxide, carbon monoxide, nitrogen oxides |

---

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Section 5. Fire-fighting measures

**5.3 Advice for firefighters**

**Special protective actions for fire-fighters**

<table>
<thead>
<tr>
<th>Product</th>
<th>Special protective actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.</td>
</tr>
<tr>
<td>Herculase II 5X Rxn 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>dNTPs 100mM</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>

**Special protective equipment for fire-fighters**

<table>
<thead>
<tr>
<th>Product</th>
<th>Special protective equipment for fire-fighters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
</tbody>
</table>

Section 6. Accidental release measures

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

<table>
<thead>
<tr>
<th>For non-emergency personnel</th>
<th>Personal precautions, protective equipment and emergency procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</td>
</tr>
</tbody>
</table>
| Herculase II Fusion Enzyme 30,000 rxn | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when
Section 6. Accidental release measures

Herculase II 5X Rxn Buffer

- When using or in the vicinity of the product, ensure ventilation is adequate. Put on appropriate personal protective equipment.
- No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

- Herculase II 5X Rxn Buffer
- dNTPs 100mM

For emergency responders:

For emergency responders:

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

- Herculase II Fusion Enzyme 30,000 rxn

- Herculase II Fusion Enzyme 30,000 rxn
- Herculase II Fusion DNA Polymerase, 30,000 Reaction Kit, Part Number 930689

- dNTPs 100mM
- dNTPs 100mM

6.2 Environmental precautions

DMSO

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

- Herculase II Fusion Enzyme 30,000 rxn

- Herculase II Fusion Enzyme 30,000 rxn
- Herculase II Fusion DNA Polymerase, 30,000 Reaction Kit, Part Number 930689

- dNTPs 100mM

- dNTPs 100mM

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Section 6. Accidental release measures

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up: DMSO

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 Enzyme 30,000 rxn

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.

Herculase II 5X Rxn 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.

dNTPs 100mM

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

Section 7. Handling and storage

7.1 Precautions for safe handling

Protective measures: DMSO

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Avoid release to the environment. 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 Enzyme 30,000 rxn

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Herculase II 5X Rxn Buffer

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.
Section 7. Handling and storage

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.

Herculase II Fusion Enzyme 30,000 rxn

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 II 5X Rxn 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.

dNTPs 100mM

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

7.2 Conditions for safe storage, including any incompatibilities

DMSO

Storage temperature: -20°C (-4°F). Store in accordance with local regulations. 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. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Herculase II Fusion Enzyme 30,000 rxn

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.

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Section 7. Handling and storage

Herculase II Fusion DNA Polymerase, 30,000 Reaction Kit, Part Number 930689

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

Herculase II 5X Rxn Buffer

Storage temperature: -20°C (-4°F). Store in accordance with local regulations. Shelf life: 1 Year. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

dNTPs 100mM

Storage temperature: -20°C (-4°F). Store in accordance with local regulations. Shelf life: 1 Year. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

Recommendations

Industrial sector specific solutions

DMSO

Herculase II Fusion Enzyme 30,000 rxn

Industrial applications, Professional applications.

Herculase II 5X Rxn Buffer

Industrial applications, Professional applications.

dNTPs 100mM

Industrial applications, Professional applications.

DMSO

Not applicable.

Herculase II Fusion Enzyme 30,000 rxn

Not applicable.

Herculase II 5X Rxn Buffer

Not applicable.

dNTPs 100mM

Not applicable.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

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## Section 8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>AIHA WEEL (United States, 10/2011). TWA: 250 ppm 8 hours.</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,0000 rxn</td>
<td>fraction TWA: 10 mg/m³ 8 hours. Form: Total dust</td>
</tr>
<tr>
<td>Glycerol</td>
<td>OSHA PEL (United States, 6/2016). TWA: 5 mg/m³ 8 hours. Form: Respirable</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>TWA: 15 mg/m³ 8 hours. Form: Total dust</td>
</tr>
<tr>
<td>Trometamol</td>
<td>None.</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>None.</td>
</tr>
<tr>
<td>Hexadecan-1-ol, ethoxylated</td>
<td>None.</td>
</tr>
</tbody>
</table>

### 8.2 Exposure controls

**Appropriate engineering controls**: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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

### Individual protection measures

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

**Eye/face protection**: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

**Skin protection**

**Hand protection**: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately 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.

**Hand protection**

**Eye/face protection**

**Skin protection**

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## Section 8. Exposure controls/personal protection

**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.

**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.

## Section 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<table>
<thead>
<tr>
<th>Physical state</th>
<th>DMSO</th>
<th>Herculase II Fusion Enzyme 30,000 rxn</th>
<th>Not available.</th>
<th>Herculase II 5X Rxn Buffer</th>
<th>Not available.</th>
<th>dNTPs 100mM</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Not available.</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td>dNTPs 100mM</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Not available.</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td>dNTPs 100mM</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Not available.</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td>dNTPs 100mM</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>8.2</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>9.5 to 10.5</td>
<td>dNTPs 100mM</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Melting point</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>18.5°C (65.3°F)</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td>dNTPs 100mM</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Boiling point</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>189°C (372.2°F)</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td>dNTPs 100mM</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>DMSO</td>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Closed cup: 87°C (188.6°F)</td>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td>dNTPs 100mM</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

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Section 9. Physical and chemical properties

Evaporation rate:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>0.026 (butyl acetate = 1)</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Flammability (solid, gas):

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Lower and upper explosive (flammable) limits:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Lower: 2.6%</td>
<td></td>
</tr>
<tr>
<td>Upper: 28.5%</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Vapor pressure:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>0.056 kPa (0.42 mm Hg) [room temperature]</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Vapor density:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>2.7 [Air = 1]</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Relative density:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Solubility:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Soluble in the following materials: cold water and hot water.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td></td>
</tr>
</tbody>
</table>

Partition coefficient: n-octanol/water:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>-1.35</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Auto-ignition temperature:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>300 to 302°C (572 to 575.6°F)</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

Decomposition temperature:

<table>
<thead>
<tr>
<th>Component</th>
<th>DMSO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>140 to 189°C (284 to 372.2°F)</td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Not available.</td>
<td></td>
</tr>
<tr>
<td>dNTPs 100mM</td>
<td>Not available.</td>
<td></td>
</tr>
</tbody>
</table>

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Section 9. Physical and chemical properties

**Viscosity**

<table>
<thead>
<tr>
<th>Material</th>
<th>Viscosity (DMSO)</th>
<th>Viscosity (Herculase II Fusion Enzyme 30, 0000 rxn)</th>
<th>Viscosity (Herculase II 5X Rxn Buffer)</th>
<th>Viscosity (dNTPs 100mM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic (room temperature)</td>
<td>2.14 mPa·s (2.14 cP)</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Section 10. Stability and reactivity

10.1 Reactivity

- **DMSO**: No specific test data related to reactivity available for this product or its ingredients.
- **Herculase II Fusion Enzyme 30, 0000 rxn**: No specific test data related to reactivity available for this product or its ingredients.
- **Herculase II 5X Rxn Buffer**: No specific test data related to reactivity available for this product or its ingredients.
- **dNTPs 100mM**: No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

- **DMSO**: The product is stable.
- **Herculase II Fusion Enzyme 30, 0000 rxn**: The product is stable.
- **Herculase II 5X Rxn Buffer**: The product is stable.
- **dNTPs 100mM**: The product is stable.

10.3 Possibility of hazardous reactions

- **DMSO**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Herculase II Fusion Enzyme 30, 0000 rxn**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Herculase II 5X Rxn Buffer**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **dNTPs 100mM**: Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

- **DMSO**: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. No specific data.
- **Herculase II Fusion Enzyme 30, 0000 rxn**: No specific data.
- **Herculase II 5X Rxn Buffer**: No specific data.
- **dNTPs 100mM**: No specific data.

10.5 Incompatible materials

- **DMSO**: Reactive or incompatible with the following materials: oxidizing materials.
- **Herculase II Fusion Enzyme 30, 0000 rxn**: May react or be incompatible with oxidizing materials.
- **Herculase II 5X Rxn Buffer**: May react or be incompatible with oxidizing materials.
- **dNTPs 100mM**: May react or be incompatible with oxidizing materials.
Section 10. Stability and reactivity

10.6 Hazardous decomposition products

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

- Herculase II Fusion Enzyme 30,000 rxn
- Herculase II 5X Rxn Buffer
- dNTPs 100mM

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 II Fusion Enzyme 30,000 rxn</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Trometamol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2840 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2500 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Hexadecan-1-ol, ethoxylated</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>2500 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>100 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>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Skin - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>25 Percent</td>
<td>-</td>
</tr>
<tr>
<td>Trometamol</td>
<td>Skin - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>500 milligrams</td>
<td>-</td>
</tr>
</tbody>
</table>

Sensitization

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Section 11. Toxicological information

Not available.

**Mutagenicity**
Conclusion/Summary: Not available.

**Carcinogenicity**
Conclusion/Summary: Not available.

**Reproductive toxicity**
Conclusion/Summary: Not available.

**Teratogenicity**
Conclusion/Summary: Not available.

Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
<tr>
<td>Trometamol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexadecan-1-ol, ethoxylated</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)
Not available.

**Aspiration hazard**
Not available.

Information on the likely routes of exposure

**Eye contact**
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
Causes eye irritation.
Causes eye irritation.

Inhalation
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Skin contact
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Ingestion
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Potential acute health effects

**Eye contact**
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
Causes eye irritation.
Causes eye irritation.

Inhalation
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Skin contact
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Ingestion
: DMSO
Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM
No known significant effects or critical hazards.
No known significant effects or critical hazards.
Section 11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact**
- DMSO
  - Adverse symptoms may include the following:
    - irritation
    - watering
    - redness
- Herculase II Fusion Enzyme 30,000 rxn
  - Adverse symptoms may include the following:
    - irritation
    - watering
    - redness
- Herculase II 5X Rxn Buffer
  - No specific data.
- dNTPs 100mM
  - No specific data.

**Inhalation**
- DMSO
  - No specific data.
- Herculase II Fusion Enzyme 30,000 rxn
  - No specific data.
- Herculase II 5X Rxn Buffer
  - No specific data.
- dNTPs 100mM
  - No specific data.

**Skin contact**
- DMSO
  - No specific data.
- Herculase II Fusion Enzyme 30,000 rxn
  - No specific data.
- Herculase II 5X Rxn Buffer
  - No specific data.
- dNTPs 100mM
  - No specific data.

**Ingestion**
- DMSO
  - No specific data.
- Herculase II Fusion Enzyme 30,000 rxn
  - No specific data.
- Herculase II 5X Rxn Buffer
  - No specific data.
- dNTPs 100mM
  - No specific data.

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

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

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

**Potential chronic health effects**
- **General**
  - DMSO
    - No known significant effects or critical hazards.
  - Herculase II Fusion Enzyme 30,000 rxn
    - No known significant effects or critical hazards.
  - Herculase II 5X Rxn Buffer
    - No known significant effects or critical hazards.
  - dNTPs 100mM
    - No known significant effects or critical hazards.
- **Carcinogenicity**
  - DMSO
    - No known significant effects or critical hazards.
  - Herculase II Fusion Enzyme 30,000 rxn
    - No known significant effects or critical hazards.
  - Herculase II 5X Rxn Buffer
    - No known significant effects or critical hazards.
  - dNTPs 100mM
    - No known significant effects or critical hazards.
- **Mutagenicity**
  - DMSO
    - No known significant effects or critical hazards.
  - Herculase II Fusion Enzyme 30,000 rxn
    - No known significant effects or critical hazards.
  - Herculase II 5X Rxn Buffer
    - No known significant effects or critical hazards.
  - dNTPs 100mM
    - No known significant effects or critical hazards.

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Section 11. Toxicological information

Teratogenicity: DMSO
No known significant effects or critical hazards.
Herculase II Fusion Enzyme 30,000 rxn
No known significant effects or critical hazards.
Herculase II 5X Rxn Buffer
No known significant effects or critical hazards.
dNTPs 100mM
No known significant effects or critical hazards.

Developmental effects: DMSO
No known significant effects or critical hazards.
Herculase II Fusion Enzyme 30,000 rxn
No known significant effects or critical hazards.
Herculase II 5X Rxn Buffer
No known significant effects or critical hazards.
dNTPs 100mM
No known significant effects or critical hazards.

Fertility effects: DMSO
No known significant effects or critical hazards.
Herculase II Fusion Enzyme 30,000 rxn
No known significant effects or critical hazards.
Herculase II 5X Rxn Buffer
No known significant effects or critical hazards.
dNTPs 100mM
No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II 5X Rxn Buffer Oral</td>
<td>81278.2 mg/kg</td>
</tr>
</tbody>
</table>

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 EC50 18299 µg/l Marine water</td>
<td>Algae - Nitzschia pungens</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 37.437 mg/l Marine water</td>
<td>Crustaceans - Artemia sp.</td>
<td>48 hours</td>
</tr>
<tr>
<td></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 3323 µg/l Marine water</td>
<td>Algae - Nitzschia pungens</td>
<td>96 hours</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn Glycerol</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer Trometamol</td>
<td>Acute EC50 &gt;980 mg/l Fresh water</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute NOEC 520 mg/l Fresh water</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 2.6 mg/l Fresh water</td>
<td>Crustaceans - Ceriodaphnia dubia - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 14000 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna - Young</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 68 µg/l Fresh water</td>
<td>Fish - Oncorhynchus gorbuscha - Alevin</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 7.5 mg/l Marine water</td>
<td>Algae - Phaeodactylum tricornutum - Exponential growth phase</td>
<td>96 hours</td>
</tr>
<tr>
<td>Hexadecan-1-ol, ethoxylated</td>
<td>Chronic NOEC 143 µg/l Marine water</td>
<td>Fish - Salmo salar - Post-smolt</td>
<td>5 weeks</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 330000 to 1000000 µg/l Marine water</td>
<td>Crustaceans - Crangon crangon - Adult</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

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Section 12. Ecological information

12.2 Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn Glycerol</td>
<td>301D Ready Biodegradability - Closed Bottle Test</td>
<td>93 % - 30 days</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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

12.3 Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP&lt;sub&gt;ow&lt;/sub&gt;</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO Dimethyl sulfoxide</td>
<td>-1.35</td>
<td>3.16</td>
<td>low</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn Glycerol</td>
<td>-1.76</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer Trometamol</td>
<td>-1.56</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Ammonium sulphate</td>
<td>-5.1</td>
<td>-</td>
<td>low</td>
</tr>
</tbody>
</table>

12.4 Mobility in soil

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

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

Section 13. Disposal considerations

13.1 Waste treatment methods

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. 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. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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Section 13. Disposal considerations

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

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

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

Section 14. Transport information

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

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

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

Section 15. Regulatory information

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

U.S. Federal regulations

Clean Water Act (CWA) 311: Edetic acid

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ: Not applicable.

SARA 311/312

Classification: DMSO

Herculase II Fusion Enzyme 30, 0000 rxn
Herculase II 5X Rxn Buffer
dNTPs 100mM

FLAMMABLE LIQUIDS - Category 4
EYE IRRITATION - Category 2B
Not applicable.

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Section 15. Regulatory information

**Composition/information on ingredients**

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO Dimethyl sulfoxide</td>
<td>100</td>
<td>FLAMMABLE LIQUIDS - Category 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EYE IRRITATION - Category 2B</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme</td>
<td>≥50 - ≤75</td>
<td>EYE IRRITATION - Category 2A</td>
</tr>
<tr>
<td>30,0000 rxn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>≤3</td>
<td>COMBUSTIBLE DUSTS</td>
</tr>
<tr>
<td>Trometamol</td>
<td></td>
<td>SKIN IRRITATION - Category 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EYE IRRITATION - Category 2A</td>
</tr>
<tr>
<td>Hexadecan-1-ol, ethoxylated</td>
<td>≤3</td>
<td>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3</td>
</tr>
</tbody>
</table>

**SARA 313**

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form R - Reporting requirements</td>
<td>Herculase II 5X Rxn Buffer Ammonium sulphate</td>
<td>7783-20-2</td>
</tr>
<tr>
<td>Supplier notification</td>
<td>Herculase II 5X Rxn Buffer Ammonium sulphate</td>
<td>7783-20-2</td>
</tr>
</tbody>
</table>

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

**State regulations**

- **Massachusetts**: The following components are listed: AMMONIUM SULFATE; GLYCERINE MIST
- **New York**: None of the components are listed.
- **New Jersey**: The following components are listed: DIMETHYL SULFOXIDE; METHANE, SULFINYLBI S-; GLYCERIN; 1,2,3-PROPANETRIOL
- **Pennsylvania**: The following components are listed: SULFURIC ACID DIAMMONIUM SALT; 1,2, 3-PROPANETRIOL

**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.

**Date of issue**: 10/18/2018
### Section 15. Regulatory information

<table>
<thead>
<tr>
<th>Country</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Europe</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Japan</td>
<td>Japan inventory (ENCS): Not determined.</td>
</tr>
<tr>
<td></td>
<td>Japan inventory (ISHL): Not determined.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Not determined.</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Philippines</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Taiwan</td>
<td>All components are listed or exempted.</td>
</tr>
<tr>
<td>Thailand</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Turkey</td>
<td>Not determined.</td>
</tr>
<tr>
<td>United States</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

### Section 16. Other information

**History**

- **Date of issue**: 10/18/2018
- **Date of previous issue**: No previous validation
- **Version**: 1

**Procedure used to derive the classification**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMSO</td>
<td>FLAMMABLE LIQUIDS - Category 4</td>
<td>On basis of test data</td>
</tr>
<tr>
<td></td>
<td>EYE IRRITATION - Category 2B</td>
<td>On basis of test data</td>
</tr>
<tr>
<td></td>
<td>AQUATIC HAZARD (ACUTE) - Category 3</td>
<td>On basis of test data</td>
</tr>
<tr>
<td></td>
<td>AQUATIC HAZARD (LONG-TERM) - Category 3</td>
<td>On basis of test data</td>
</tr>
<tr>
<td>Herculase II Fusion Enzyme 30,000 rxn</td>
<td>EYE IRRITATION - Category 2B</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Herculase II 5X Rxn Buffer</td>
<td>AQUATIC HAZARD (ACUTE) - Category 2</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

▶ Indicates information that has changed from previously issued version.

**Notice to reader**

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