

# SAFETY DATA SHEET



Herculase II Fusion DNA Polymerase, Part Number 600675

## Section 1. Identification

### 1.1 Product identifier

**Product name** : Herculase II Fusion DNA Polymerase, Part Number 600675  
**Part No. (Chemical Kit)** : 600675  
**Part No.** : DMSO 600260-53  
 Herculase II Fusion DNA Polymerase 600675-51  
 5X Herculase II Reaction Buffer 600675-52  
**Validation date** : 5/19/2017

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

**Material uses** : Analytical reagent.  
 DMSO 1 ml  
 5X Herculase II Reaction Buffer 1.5 ml  
 Herculase II Fusion DNA Polymerase 40 µl (40 reactions)

### 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  
 Herculase II Fusion DNA Polymerase  
 5X Herculase II Reaction Buffer  
 This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

### Classification of the substance or mixture

DMSO  
 H227 FLAMMABLE LIQUIDS - Category 4  
 H320 EYE IRRITATION - Category 2B

**Herculase II Fusion DNA Polymerase**  
 H320 EYE IRRITATION - Category 2B

## Section 2. Hazards identification

**Ingredients of unknown toxicity** : Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 30 - 60%  
Percentage of the mixture consisting of ingredient (s) of unknown dermal toxicity: 1 - 10%  
Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 1 - 10%

### 2.2 GHS label elements

**Signal word** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

Warning  
Warning

**Hazard statements** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

No signal word.  
H227 - Combustible liquid.  
H320 - Causes eye irritation.  
H320 - Causes eye irritation.

**Precautionary statements**

**Prevention** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

P280 - Wear protective gloves. Wear eye or face protection.  
P210 - Keep away from flames and hot surfaces. - No smoking.  
P264 - Wash hands thoroughly after handling.  
P264 - Wash hands thoroughly after handling.

**Response** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

Not applicable.  
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.  
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.

**Storage** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

Not applicable.  
P403 - Store in a well-ventilated place.  
P235 - Keep cool.  
Not applicable.

**Disposal** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

Not applicable.  
P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.  
Not applicable.

**Supplemental label elements** : DMSO  
Herculase II Fusion DNA Polymerase  
5X Herculase II Reaction Buffer

Not applicable.  
None known.  
None known.  
None known.

### 2.3 Other hazards

## Section 2. Hazards identification

<b>Hazards not otherwise classified</b>	: <b>DMSO</b>	None known.
	Herculase II Fusion DNA Polymerase	None known.
	5X Herculase II Reaction Buffer	None known.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: <b>DMSO</b>	Substance
	Herculase II Fusion DNA Polymerase	Mixture
	5X Herculase II Reaction Buffer	Mixture

Ingredient name	%	CAS number
<b>DMSO</b> Dimethyl sulfoxide	100	67-68-5
<b>Herculase II Fusion DNA Polymerase</b> Glycerol	≥50 - ≤75	56-81-5
<b>5X Herculase II Reaction Buffer</b> Trometamol	≤3	77-86-1
Ammonium sulphate	≤3	7783-20-2

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

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



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

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

<b>Eye contact</b>	: <b>DMSO</b>	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.
	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. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	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. Get medical attention if irritation occurs.
<b>Inhalation</b>	: <b>DMSO</b>	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.
	Herculase II Fusion DNA	Remove victim to fresh air and keep at rest in a

## Section 4. First aid measures

	Polymerase	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.
	5X Herculase II Reaction Buffer	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Skin contact</b>	:  DMSO	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 DNA Polymerase	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.
	5X Herculase II Reaction Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
<b>Ingestion</b>	:  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 DNA Polymerase	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.

## Section 4. First aid measures

5X Herculase II Reaction Buffer

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.

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

<b>Eye contact</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Causes eye irritation. Causes eye irritation.
<b>Inhalation</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

<b>Eye contact</b>	: DMSO  Herculase II Fusion DNA Polymerase  5X Herculase II Reaction Buffer	Adverse symptoms may include the following: irritation watering redness Adverse symptoms may include the following:  irritation watering redness
<b>Inhalation</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data. No specific data.
<b>Skin contact</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data. No specific data.
<b>Ingestion</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data. No specific data.

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

## Section 4. First aid measures

<b>Notes to physician</b>	: DMSO	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	Herculase II Fusion DNA Polymerase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	5X Herculase II Reaction 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.
<b>Specific treatments</b>	: DMSO	No specific treatment.
	Herculase II Fusion DNA Polymerase	No specific treatment.
	5X Herculase II Reaction Buffer	No specific treatment.
<b>Protection of first-aiders</b>	: 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. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	5X Herculase II Reaction Buffer	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

<b>Suitable extinguishing media</b>	: DMSO	Use dry chemical, CO <sub>2</sub> , 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.
<b>Unsuitable extinguishing media</b>	: DMSO	Do not use water jet.
	Herculase II Fusion DNA Polymerase	None known.
	5X Herculase II Reaction Buffer	None known.

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

<b>Specific hazards arising from the chemical</b>	: 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 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.
	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.

## Section 5. Fire-fighting measures

### Hazardous thermal decomposition products

:  DMSO

Herculase II Fusion DNA Polymerase

5X Herculase II Reaction Buffer

Decomposition products may include the following materials:

carbon dioxide  
carbon monoxide  
sulfur oxides

Decomposition products may include the following materials:

carbon dioxide  
carbon monoxide

Decomposition products may include the following materials:

carbon dioxide  
carbon monoxide  
nitrogen oxides  
sulfur oxides  
metal oxide/oxides

### 5.3 Advice for firefighters

#### Special protective actions for fire-fighters

:  DMSO

Herculase II Fusion DNA Polymerase

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. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

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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

Herculase II Fusion DNA Polymerase

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.

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

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## Section 6. Accidental release measures

### 6.1 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. 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.

## Section 6. Accidental release measures

Herculase II Fusion DNA Polymerase

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

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 spilled material. Put on appropriate personal protective equipment.

**For emergency responders :** DMSO

Herculase II Fusion DNA Polymerase

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

5X Herculase II Reaction Buffer

### 6.2 Environmental precautions

: DMSO

Herculase II Fusion DNA Polymerase

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

5X Herculase II Reaction Buffer

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Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

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

**Methods for cleaning up :** DMSO

Herculase II Fusion DNA Polymerase

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.

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 6. Accidental release measures

5X Herculase II Reaction Buffer

disposal contractor.  
 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

: MSO

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

5X Herculase II Reaction Buffer

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

#### Advice on general occupational hygiene

: MSO

Herculase II Fusion DNA Polymerase

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. 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.

5X Herculase II Reaction Buffer

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

## Section 7. Handling and storage

### 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 DNA Polymerase

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

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 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

:  DMSO

Herculase II Fusion DNA Polymerase

Industrial applications, Professional applications.  
Industrial applications, Professional applications.

5X Herculase II Reaction Buffer

Industrial applications, Professional applications.

#### Industrial sector specific solutions

:  DMSO

Herculase II Fusion DNA Polymerase

Not applicable.  
Not applicable.

5X Herculase II Reaction Buffer

Not applicable.

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

## Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
<b>DMSO</b> Dimethyl sulfoxide	<b>AIHA WEEL (United States, 10/2011).</b> TWA: 250 ppm 8 hours.
<b>Herculase II Fusion DNA Polymerase</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 6/2016).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust
<b>5X Herculase II Reaction Buffer</b> Trometamol Ammonium sulphate	None. None.

### 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.

##### 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 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.

## Section 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Liquid. [Clear.] Liquid. Liquid.
<b>Color</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Colorless. Not available. Not available.
<b>Odor</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Odorless. [Slight] Not available. Not available.
<b>Odor threshold</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Not available. Not available. Not available.
<b>pH</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Not available. 8.2 10
<b>Melting point</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	18.5°C (65.3°F) Not available. Not available.
<b>Boiling point</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	189°C (372.2°F) Not available. Not available.
<b>Flash point</b>	: DMSO  Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Closed cup: 87°C (188.6°F) Open cup: 87°C (188.6°F) Not available. Not available.
<b>Evaporation rate</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	0.026 (butyl acetate = 1) Not available. Not available.
<b>Flammability (solid, gas)</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Not applicable. Not applicable. Not applicable.
<b>Lower and upper explosive (flammable) limits</b>	: DMSO  Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Lower: 2.6% Upper: 28.5% Not available. Not available.

## Section 9. Physical and chemical properties

<b>Vapor pressure</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	0.056 kPa (0.42 mm Hg) [room temperature] Not available. Not available.
<b>Vapor density</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	2.7 [Air = 1] Not available. Not available.
<b>Relative density</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	1.1 Not available. Not available.
<b>Solubility</b>	: DMSO  Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	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.
<b>Partition coefficient: n-octanol/water</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	-1.35 Not available. Not available.
<b>Auto-ignition temperature</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	300 to 302°C (572 to 575.6°F) Not available. Not available.
<b>Decomposition temperature</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	140 to 189°C (284 to 372.2°F) Not available. Not available.
<b>Viscosity</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Dynamic (room temperature): 2.14 mPa·s (2.14 cP) Not available. Not available.

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: DMSO  Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	The product is stable. The product is stable. The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: DMSO  Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.

## Section 10. Stability and reactivity

<b>10.4 Conditions to avoid</b>	: <b>DMSO</b>	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 DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data.
<b>10.5 Incompatible materials</b>	: <b>DMSO</b>	Reactive or incompatible with the following materials: oxidizing materials May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials.
	Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials.
<b>10.6 Hazardous decomposition products</b>	: <b>DMSO</b>	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Herculase II Fusion DNA Polymerase  5X Herculase II Reaction Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.  Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>DMSO</b> Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
<b>Herculase II Fusion DNA Polymerase</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
<b>5X Herculase II Reaction Buffer</b> Trometamol	LD50 Dermal LD50 Oral	Rat Rat	>5000 mg/kg 5000 mg/kg	- -
Ammonium sulphate	LD50 Oral	Rat	2840 mg/kg	-

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>DMSO</b> Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-

## Section 11. Toxicological information

<b>Herculase II Fusion DNA Polymerase</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>5X Herculase II Reaction Buffer</b> Trometamol	Skin - Moderate irritant	Rabbit	-	25 Percent	-
	Skin - Severe irritant	Rabbit	-	500 milligrams	-

### Sensitization

Not available.

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
<b>5X Herculase II Reaction Buffer</b> Trometamol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

### Information on the likely routes of exposure

:  DMSO

Herculase II Fusion DNA Polymerase  
 5X Herculase II Reaction Buffer

Routes of entry anticipated: Oral, Dermal, Inhalation.

Routes of entry anticipated: Oral, Dermal, Inhalation.

Routes of entry anticipated: Oral, Dermal, Inhalation.

### Potential acute health effects

#### Eye contact

:  DMSO

Herculase II Fusion DNA Polymerase  
 5X Herculase II Reaction Buffer

Causes eye irritation.

Causes eye irritation.

No known significant effects or critical hazards.

#### Inhalation

:  DMSO

Herculase II Fusion DNA Polymerase  
 5X Herculase II Reaction Buffer

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

## Section 11. Toxicological information

<b>Skin contact</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

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

<b>Eye contact</b>	: DMSO  Herculase II Fusion DNA Polymerase  5X Herculase II Reaction Buffer	Adverse symptoms may include the following: irritation watering redness Adverse symptoms may include the following:  irritation watering redness
<b>Inhalation</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data.
<b>Skin contact</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data.
<b>Ingestion</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No specific data. No specific data. 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

<b>General</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: DMSO Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.



## Section 11. Toxicological information

<b>Mutagenicity</b>	: <b>DMSO</b> Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Teratogenicity</b>	: <b>DMSO</b> Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Developmental effects</b>	: <b>DMSO</b> Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Fertility effects</b>	: <b>DMSO</b> Herculase II Fusion DNA Polymerase 5X Herculase II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
<b>5X Herculase II Reaction Buffer</b> Oral	81278.2 mg/kg

## Section 12. Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>DMSO</b> Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 100 µl/L Marine water	Algae - Ulva lactuca	72 hours
<b>Herculase II Fusion DNA Polymerase</b> Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
<b>5X Herculase II Reaction Buffer</b> Trometamol Ammonium sulphate	Acute EC50 >980 mg/l Fresh water	Daphnia	48 hours
	Acute NOEC 520 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 2.6 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Young	48 hours
	Acute LC50 14000 to 15000 µg/l Fresh water	Daphnia - Daphnia magna - Young	48 hours
	Acute LC50 68 µg/l Fresh water	Fish - Oncorhynchus gorbuscha - Alevin	96 hours
	Chronic NOEC 7.5 mg/l Marine water	Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours
	Chronic NOEC 143 µg/l Marine water	Fish - Salmo salar - Post-smolt	5 weeks

## Section 12. Ecological information

### 12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>5X Herculase II Reaction Buffer</b> Ammonium sulphate	-	-	Readily

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>DMSO</b> Dimethyl sulfoxide	-1.35	3.16	low
<b>Herculase II Fusion DNA Polymerase</b> Glycerol	-1.76	-	low
<b>5X Herculase II Reaction Buffer</b> Trometamol	-1.56	-	low
Ammonium sulphate	-5.1	-	low

### 12.4 Mobility in soil

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

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

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. 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.

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** : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined  
**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** Fire hazard  
 Immediate (acute) health hazard  
 Immediate (acute) health hazard  
**Herculase II Fusion DNA Polymerase**  
 5X Herculase II Reaction Buffer Not applicable.

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
<b>DMSO</b> Dimethyl sulfoxide	100	Yes.	No.	No.	Yes.	No.
<b>Herculase II Fusion DNA Polymerase</b> Glycerol	≥50 - ≤75	No.	No.	No.	Yes.	No.
<b>5X Herculase II Reaction Buffer</b>						

## Section 15. Regulatory information

Trometamol	≤3	Yes.	No.	No.	Yes.	No.
Ammonium sulphate	≤3	No.	No.	No.	Yes.	No.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	<input checked="" type="checkbox"/> Herculase II Reaction Buffer Ammonium sulphate	7783-20-2	≤3
<b>Supplier notification</b>	<input checked="" type="checkbox"/> Herculase II Reaction Buffer Ammonium sulphate	7783-20-2	≤3

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

### State regulations

- Massachusetts** : The following components are listed: GLYCERINE MIST
- New York** : None of the components are listed.
- New Jersey** : The following components are listed: DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-; GLYCERIN; 1,2,3-PROPANETRIOL
- Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL
- California Prop. 65**  
 Not available.

### 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.

## Section 15. Regulatory information

**Viet Nam** :  Not determined.

## Section 16. Other information

### History

**Date of issue** : 05/19/2017

**Date of previous issue** : 04/26/2016.

**Version** : 5

✓ Indicates information that has changed from previously issued version.

### Notice to reader

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