

SAFETY DATA SHEET

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

Section 1. Identification

Product identifier : 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 30,000 rxn 930689-51
 Herculase II 5X Rxn Buffer 930689-52
 dNTPs 100mM 930689-53

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

Identified uses : Analytical reagent.

DMSO 2 x 37.5 ml
 Herculase II Fusion Enzyme 30,000 rxn 1 x 30 ml (30,000 reaction)
 Herculase II 5X Rxn Buffer 9 x 50 ml
 dNTPs 100mM 1 x 15 ml

Supplier/Manufacturer : Agilent Technologies, Inc.
 5301 Stevens Creek Blvd
 Santa Clara, CA 95051, USA
 800-227-9770

Emergency telephone number (with hours of operation) : CHEMTREC®: 1-800-424-9300

Section 2. Hazard identification

Classification of the substance or mixture

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

Herculase II Fusion Enzyme 30,000 rxn
 H320 EYE IRRITATION - Category 2B

GHS label elements

Signal word : DMSO Warning
 Herculase II Fusion Enzyme 30,000 rxn Warning
 Herculase II 5X Rxn Buffer No signal word.
 dNTPs 100mM No signal word.

Hazard statements : DMSO H227 - Combustible liquid.
 H320 - Causes eye irritation.
 Herculase II Fusion Enzyme 30,000 rxn H320 - Causes eye irritation.
 Herculase II 5X Rxn Buffer No known significant effects or critical hazards.
 dNTPs 100mM No known significant effects or critical hazards.

Precautionary statements

Section 2. Hazard identification

Prevention	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Not applicable. Not applicable. Not applicable.
Response	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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 advice or 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 advice or attention. Not applicable. Not applicable.
Storage	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	Not applicable. Not applicable.
Disposal	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable. Not applicable.
Supplemental label elements	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM <input checked="" type="checkbox"/> dNTPs 100mM	None known. None known. None known. None known. Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5.4%
Other hazards which do not result in classification	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	None known. None known. None known. None known.

Section 3. Composition/information on ingredients

Substance/mixture	: <input checked="" type="checkbox"/> DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	Substance Mixture Mixture Mixture
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Section 3. Composition/information on ingredients

Ingredient name	Synonyms	% (w/w)	CAS number
DMSO Dimethyl sulfoxide	DMSO	100	67-68-5
Herculase II Fusion Enzyme 30,000 rxn Glycerol	Glycerol	≥30 - ≤60	56-81-5
Herculase II 5X Rxn Buffer Trometamol	Tris	≥1 - ≤5	77-86-1
Hexadecan-1-ol, ethoxylated	Hexadecan-1-ol, ethoxylated	≥1 - ≤5	9004-95-9

Ranges if listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.

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



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

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact	: DMSO	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	Herculase II Fusion Enzyme 30,000 rxn	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 5X Rxn 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.
	dNTPs 100mM	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.
Inhalation	: DMSO	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 Enzyme 30,000 rxn	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if

Section 4. First-aid measures

		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 5X Rxn 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.
	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	:  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 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.
	Herculase II 5X Rxn Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	dNTPs 100mM	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	:  DMSO	Wash out mouth with water. Remove dentures if any. 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 30,000 rxn	Wash out mouth with water. Remove dentures if any. 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

Section 4. First-aid measures

Herculase II 5X Rxn Buffer	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. 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.
	Wash out mouth with water. 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.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: DMSO Herculase II Fusion Enzyme 30,000 rxn	Causes eye irritation. Causes eye irritation.
	Herculase II 5X Rxn Buffer dNTPs 100mM	No known significant effects or critical hazards. No known significant effects or critical hazards.
Inhalation	: DMSO Herculase II Fusion Enzyme 30,000 rxn	No known significant effects or critical hazards. No known significant effects or critical hazards.
	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 30,000 rxn	No known significant effects or critical hazards. No known significant effects or critical hazards.
	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 30,000 rxn	No known significant effects or critical hazards. No known significant effects or critical hazards.
	Herculase II 5X Rxn Buffer dNTPs 100mM	No known significant effects or critical hazards. No known significant effects or critical hazards.

Over-exposure signs/symptoms

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

Section 4. First-aid measures

Skin contact	: DMSO	No specific data.
	Herculase II Fusion Enzyme 30,0000 rxn	No specific data.
	Herculase II 5X Rxn Buffer dNTPs 100mM	No specific data. No specific data.
Ingestion	: DMSO	No specific data.
	Herculase II Fusion Enzyme 30,0000 rxn	No specific data.
	Herculase II 5X Rxn Buffer dNTPs 100mM	No specific data. No specific data.

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 30,0000 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 30,0000 rxn	No specific treatment.
	Herculase II 5X Rxn Buffer dNTPs 100mM	No specific treatment. 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 30,0000 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.
	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

Extinguishing media

Suitable extinguishing media	: DMSO	Use dry chemical, CO ₂ , water spray (fog) or foam.
	Herculase II Fusion Enzyme 30,0000 rxn	Use an extinguishing agent suitable for the surrounding fire.
	Herculase II 5X Rxn Buffer	Use an extinguishing agent suitable for the surrounding fire.
	dNTPs 100mM	Use an extinguishing agent suitable for the surrounding fire.

Section 5. Fire-fighting measures

Unsuitable extinguishing media	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	Do not use water jet. None known. None known. None known.
Specific hazards arising from the chemical	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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 Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides
Special protective actions for fire-fighters	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. 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. 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. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters

: DMSO

Herculase II Fusion Enzyme
30,000 rxn

Herculase II 5X Rxn Buffer

dNTPs 100mM

action shall be taken involving any personal risk or without suitable training.

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

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: DMSO

Herculase II Fusion Enzyme
30,000 rxn

Herculase II 5X Rxn Buffer

dNTPs 100mM

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.

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.

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.

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 Enzyme
30,000 rxn

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".

Section 6. Accidental release measures

Herculase II 5X Rxn Buffer	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".
dNTPs 100mM	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".

Environmental precautions : DMSO

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

Methods and materials for containment and cleaning up

Methods for cleaning up : DMSO

Herculase II Fusion Enzyme 30,000 rxn	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 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

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. 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
dNTPs 100mM

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

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

Advice on general occupational hygiene :  DMSO

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

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

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

Conditions for safe storage, including any incompatibilities : DMSO

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

Section 8. Exposure controls/personal protection

[Control parameters](#)

[Occupational exposure limits](#)

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
<p>DMSO Dimethyl sulfoxide</p> <p>Herculase II Fusion Enzyme 30,000 rxn Glycerol</p>	<p>OARS WEEL (United States, 4/2022). TWA: 250 ppm 8 hours.</p> <p>CA Alberta Provincial (Canada, 6/2018). OEL: 10 mg/m³ 8 hours. Form: Mist</p> <p>CA Quebec Provincial (Canada, 6/2022). TWA_{EV}: 10 mg/m³ 8 hours. Form: mist</p> <p>CA Saskatchewan Provincial (Canada, 7/2013). STEL: 20 mg/m³ 15 minutes. Form: mist TWA: 10 mg/m³ 8 hours. Form: mist</p> <p>CA British Columbia Provincial (Canada, 6/2023). TWA: 3 mg/m³ 8 hours. Form: respirable mist TWA: 10 mg/m³ 8 hours. Form: total mist</p>

Biological exposure indices

No exposure indices known.

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.

Section 8. Exposure controls/personal protection

- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state	: DMSO	Liquid. [Clear.]
	Herculase II Fusion Enzyme 30,000 rxn	Liquid.
	Herculase II 5X Rxn Buffer dNTPs 100mM	Liquid. Liquid.
Color	: DMSO	Colorless.
	Herculase II Fusion Enzyme 30,000 rxn	Not available.
	Herculase II 5X Rxn Buffer dNTPs 100mM	Not available. Not available.
Odor	: DMSO	Odorless. [Slight]
	Herculase II Fusion Enzyme 30,000 rxn	Not available.
	Herculase II 5X Rxn Buffer dNTPs 100mM	Not available. Not available.
Odor threshold	: DMSO	Not available.
	Herculase II Fusion Enzyme 30,000 rxn	Not available.
	Herculase II 5X Rxn Buffer dNTPs 100mM	Not available. Not available.
pH	: DMSO	Not available.
	Herculase II Fusion Enzyme 30,000 rxn	8.2
	Herculase II 5X Rxn Buffer dNTPs 100mM	9.5 to 10.5 7.5
Melting point/freezing point	: DMSO	18.5°C (65.3°F)
	Herculase II Fusion Enzyme 30,000 rxn	Not available.
	Herculase II 5X Rxn Buffer dNTPs 100mM	Not available. Not available.
Boiling point, initial boiling point, and boiling range	: DMSO	189°C (372.2°F)
	Herculase II Fusion Enzyme 30,000 rxn	Not available.
	Herculase II 5X Rxn Buffer dNTPs 100mM	Not available. Not available.

Section 9. Physical and chemical properties and safety characteristics

Flash point : **DMSO** Closed cup: 87°C (188.6°F) [ASTM D 93]
Open cup: 87°C (188.6°F)
Herculase II Fusion Enzyme 30,000 rxn Not available.
Herculase II 5X Rxn Buffer dNTPs 100mM Not available.
Not available.

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
Herculase II Fusion Enzyme 30,000 rxn						
Glycerol	-	-	-	177	350.6	-

Evaporation rate : **DMSO** 0.026 (butyl acetate = 1)
Herculase II Fusion Enzyme 30,000 rxn Not available.
Herculase II 5X Rxn Buffer dNTPs 100mM Not available.
Not available.

Flammability : **DMSO** Not applicable.
Herculase II Fusion Enzyme 30,000 rxn Not applicable.
Herculase II 5X Rxn Buffer dNTPs 100mM Not applicable.
Not applicable.

Lower and upper explosion limit/flammability limit : **DMSO** Lower: 2.6%
Upper: 28.5%
Herculase II Fusion Enzyme 30,000 rxn Not available.
Herculase II 5X Rxn Buffer dNTPs 100mM Not available.
Not available.

Vapor pressure : **DMSO** 0.056 kPa (0.42 mm Hg) [EU A.4]

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Herculase II Fusion Enzyme 30,000 rxn						
water	17.5	2.3	-	92.258	12.3	-
Glycerol	0.000075	0.00001	-	0.0025	0.00033	-
Herculase II 5X Rxn Buffer						
water	17.5	2.3	-	92.258	12.3	-
Trometamol	<0.00075006	<0.0001	-	-	-	-
dNTPs 100mM						
water	17.5	2.3	-	92.258	12.3	-

Section 9. Physical and chemical properties and safety characteristics

Relative vapor density : **DMSO** 2.7 [Air = 1]
 Herculase II Fusion Enzyme 30,000 rxn Not available.
 Herculase II 5X Rxn Buffer dNTPs 100mM Not available.

Relative density : **DMSO** 1.1
 Herculase II Fusion Enzyme 30,000 rxn Not available.
 Herculase II 5X Rxn Buffer dNTPs 100mM Not available.

Solubility(ies)	Media	Result
	DMSO	
	water	Soluble
	Herculase II Fusion Enzyme 30,000 rxn	
	water	Soluble
	Herculase II 5X Rxn Buffer	
	water	Soluble
	dNTPs 100mM	
	water	Soluble

Partition coefficient: n-octanol/water : **DMSO** -1.35
 Herculase II Fusion Enzyme 30,000 rxn Not applicable.
 Herculase II 5X Rxn Buffer dNTPs 100mM Not applicable.

Auto-ignition temperature : **DMSO** 300 to 302°C (572 to 575.6°F)

Ingredient name	°C	°F	Method
Herculase II Fusion Enzyme 30,000 rxn			
Glycerol	370	698	-







Decomposition temperature : **DMSO** 140 to 189°C (284 to 372.2°F)
 Herculase II Fusion Enzyme 30,000 rxn Not available.
 Herculase II 5X Rxn Buffer dNTPs 100mM Not available.

Viscosity : **DMSO** Dynamic: 2.14 mPa·s (2.14 cP)
 Herculase II Fusion Enzyme 30,000 rxn Not available.
 Herculase II 5X Rxn Buffer dNTPs 100mM Not available.

Particle characteristics

Median particle size : **DMSO** Not applicable.
 Herculase II Fusion Enzyme 30,000 rxn Not applicable.
 Herculase II 5X Rxn Buffer dNTPs 100mM Not applicable.

Section 10. Stability and reactivity

Reactivity	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	The product is stable. The product is stable. Shelf life: 1 Year. Shelf life: 1 Year.
Possibility of hazardous reactions	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. No specific data. No specific data.
Incompatible materials	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. May react or be incompatible with oxidizing materials.
Hazardous decomposition products	:  DMSO Herculase II Fusion Enzyme 30,000 rxn Herculase II 5X Rxn Buffer dNTPs 100mM	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. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
DMSO Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
Herculase II Fusion Enzyme 30,000 rxn Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Herculase II 5X Rxn Buffer Trometamol Hexadecan-1-ol, ethoxylated	LD50 Dermal LD50 Oral	Rat Rat	>5000 mg/kg 2500 mg/kg	- -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
DMSO Dimethyl sulfoxide	Eyes - Mild irritant Eyes - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500 mg	- -
	Skin - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500 mg	- -
Herculase II Fusion Enzyme 30,000 rxn Glycerol	Eyes - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	24 hours 500 mg 24 hours 500 mg	- -
Herculase II 5X Rxn Buffer Trometamol	Skin - Moderate irritant Skin - Severe irritant	Rabbit Rabbit	- -	25 % 500 mg	- -

Sensitization

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)

Name	Category	Route of exposure	Target organs
Herculase II 5X Rxn Buffer Trometamol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Section 11. Toxicological information

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure	: DMSO	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
	Herculase II Fusion Enzyme 30,000 rxn	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
	Herculase II 5X Rxn Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
	dNTPs 100mM	Not available.

Potential acute health effects

Eye contact	: DMSO	Causes eye irritation.
	Herculase II Fusion Enzyme 30,000 rxn	Causes eye irritation.
	Herculase II 5X Rxn Buffer	No known significant effects or critical hazards.
	dNTPs 100mM	No known significant effects or critical hazards.
Inhalation	: 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.
Skin contact	: 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.
Ingestion	: 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.

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 dNTPs 100mM	No specific data. 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.

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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.
Reproductive toxicity	: 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

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
DMSO Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Herculase II Fusion Enzyme 30,000 rxn Glycerol	12600	N/A	N/A	N/A	N/A
Herculase II 5X Rxn Buffer Herculase II 5X Rxn Buffer Hexadecan-1-ol, ethoxylated	112802.7 2500	N/A N/A	N/A N/A	N/A N/A	N/A N/A

Section 11. Toxicological information

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
DMSO Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 ul/L Marine water Chronic NOEC 100 ul/L Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate Fish - <i>Pimephales promelas</i> Algae - <i>Ulva lactuca</i> Daphnia - <i>Daphnia magna</i> - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 96 hours 72 hours 21 days
Herculase II Fusion Enzyme 30,000 rxn Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
Herculase II 5X Rxn Buffer Trometamol	Acute EC50 >980 mg/l Fresh water Acute NOEC 520 mg/l Fresh water	Daphnia Daphnia	48 hours 48 hours
Hexadecan-1-ol, ethoxylated	Acute LC50 330000 to 1000000 µg/l Marine water	Crustaceans - <i>Crangon crangon</i> - Adult	48 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
DMSO Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
Herculase II Fusion Enzyme 30,000 rxn Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Herculase II 5X Rxn Buffer Trometamol	OECD 301F Ready Biodegradability - Manometric Respirometry Test	97.1 % - Readily - 28 days	30 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
DMSO Dimethyl sulfoxide	-	-	Not readily
Herculase II 5X Rxn Buffer Trometamol	-	-	Readily
Hexadecan-1-ol, ethoxylated	-	-	Readily

Section 12. Ecological information

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
DMSO Dimethyl sulfoxide	-1.35	3.16	Low
Herculase II Fusion Enzyme 30,000 rxn Glycerol	-1.76	-	Low
Herculase II 5X Rxn Buffer Trometamol	-2.31	-	Low
Hexadecan-1-ol, ethoxylated	>6.06	-	High

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

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

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or 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.

Section 14. Transport information

TDG / 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 IMO instruments : Not available.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

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

Canada : Not determined.

United States : Not determined.

Section 16. Other information

History

Date of issue/Date of revision : 04/30/2024

Date of previous issue : 03/29/2021

Version : 3

Key to abbreviations

: ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 HPR = Hazardous Products Regulations
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 N/A = Not available
 UN = United Nations

Procedure used to derive the classification

Classification	Justification
<input checked="" type="checkbox"/> DMSO FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B	On basis of test data On basis of test data
Herculase II Fusion Enzyme 30,000 rxn EYE IRRITATION - Category 2B	Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Other information

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