Conforms to Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals

SAFETY DATA SHEET

Agilent Technologies

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 30,0000 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 30,0000 rxn	1 x 30 ml (30,0000 reaction)
Herculase II 5X Rxn Buffer	9 x 50 ml
dNTPs 100mM	1 x 15 ml

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

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

Section 2. Hazard(s) identification

Classification of the substance or mixture

DMSO

H227	FLAMMABLE LIQUIDS - Category 4
H320	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B

Herculase II Fusion Enzyme 30,0000 rxn

H320	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B

Herculase II 5X Rxn Buffer

H319	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A

dNTPs 100mM — Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5.4%

GHS label elements

Hazard pictograms : Herculase II 5X Rxn Buffer

Signal word :

DMSO	WARNING
Herculase II Fusion Enzyme 30,0000 rxn	WARNING
Herculase II 5X Rxn Buffer	WARNING
dNTPs 100mM	No signal word.

Section 2. Hazard(s) identification

Hazard statements	: DMSO	H227 - Combustible liquid. H320 - Causes eye irritation.
	Herculase II Fusion Enzyme 30,0000 rxn	H320 - Causes eye irritation.
	Herculase II 5X Rxn Buffer	H319 - Causes serious eye irritation.
	dNTPs 100mM	No known significant effects or critical hazards.
Precautionary statements		
Prevention	: DMSO	P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	Herculase II Fusion Enzyme 30,0000 rxn	Not applicable.
	Herculase II 5X Rxn Buffer	P280 - Wear eye or face protection.
	dNTPs 100mM	Not applicable.
Response	: DMSO	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
	Herculase II Fusion Enzyme 30,0000 rxn	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
	Herculase II 5X Rxn Buffer	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.
	dNTPs 100mM	Not applicable.
Storage	: DMSO	Not applicable.
	Herculase II Fusion Enzyme 30,0000 rxn	Not applicable.
	Herculase II 5X Rxn Buffer	Not applicable.
	dNTPs 100mM	Not applicable.
Disposal	: DMSO	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	Herculase II Fusion Enzyme 30,0000 rxn	Not applicable.
	Herculase II 5X Rxn Buffer	Not applicable.
	dNTPs 100mM	Not applicable.
Supplemental label elements		
Additional warning phrases	: DMSO	Not applicable.
	Herculase II Fusion Enzyme 30,0000 rxn	Not applicable.
	Herculase II 5X Rxn Buffer	Not applicable.
	dNTPs 100mM	Not applicable.
Other hazards which do not result in classification	: DMSO	None known.
	Herculase II Fusion Enzyme 30,0000 rxn	None known.
	Herculase II 5X Rxn Buffer	None known.
	dNTPs 100mM	None known.

Section 3. Composition and ingredient information

Substance/mixture : DMSO — Substance
Herculase II Fusion Enzyme 30,0000 rxn — Mixture
Herculase II 5X Rxn Buffer — Mixture
dNTPs 100mM — Mixture

CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
DMSO		
Dimethyl sulfoxide	100	67-68-5
Herculase II Fusion Enzyme 30,0000 rxn		
Glycerol	≥30 - ≤60	56-81-5
Herculase II 5X Rxn Buffer		
Hexadecan-1-ol, ethoxylated	<3	9004-95-9

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.

The total concentration of ingredients in this product, reported or not in this section, is 100%.

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 30,0000 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. Continue to rinse for at least 10 minutes. Get medical attention.
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 — Remove victim to fresh air and keep at rest in a

Section 4. First aid measures

	30,0000 rxn	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 5X Rxn Buffer	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need 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 30,0000 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. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	dNTPs 100mM	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
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 30,0000 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

Section 4. First aid measures

	drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Herculase II 5X Rxn Buffer	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
dNTPs 100mM	Wash out mouth with water. 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	Causes eye irritation.
		Herculase II Fusion Enzyme 30,0000 rxn	Causes eye irritation.
		Herculase II 5X Rxn Buffer	Causes serious eye irritation.
		dNTPs 100mM	No known significant effects or critical hazards.
Inhalation	:	DMSO	No known significant effects or critical hazards.
		Herculase II Fusion Enzyme 30,0000 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 30,0000 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 30,0000 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.

Over-exposure signs/symptoms

Section 4. First aid measures

Eye contact :

DMSO	Adverse symptoms may include the following: irritation watering redness
Herculase II Fusion Enzyme 30,0000 rxn	Adverse symptoms may include the following: irritation watering redness
Herculase II 5X Rxn Buffer	Adverse symptoms may include the following: pain or irritation watering redness
dNTPs 100mM	No specific data.

Inhalation :

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

Skin contact :

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

Ingestion :

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

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	No specific treatment.
dNTPs 100mM	No specific treatment.

Protection of first-aiders :

DMSO	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Herculase II Fusion Enzyme 30,0000 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. It may be dangerous to the person providing aid to give mouth-to-mouth

Section 4. First aid measures

	resuscitation.
dNTPs 100mM	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media

DMSO	Use dry chemical, 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.

Unsuitable extinguishing media

DMSO	Do not use water jet.
Herculase II Fusion Enzyme 30,0000 rxn	None known.
Herculase II 5X Rxn Buffer	None known.
dNTPs 100mM	None known.

Specific hazards arising from the chemical

DMSO	Combustible liquid. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.
Herculase II Fusion Enzyme 30,0000 rxn	In a fire or if heated, a pressure increase will occur and the container may burst.
Herculase II 5X Rxn Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
dNTPs 100mM	In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products

DMSO	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
Herculase II Fusion Enzyme 30,0000 rxn	Decomposition products may include the following materials: carbon dioxide carbon monoxide
Herculase II 5X Rxn Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides metal oxide/oxides
dNTPs 100mM	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides

Section 5. Firefighting measures

Special protective actions for fire-fighters	: DMSO	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
	Herculase II Fusion Enzyme 30,0000 rxn	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.
	Herculase II 5X Rxn 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.
	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.
Special protective equipment for fire-fighters	: DMSO	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Herculase II Fusion Enzyme 30,0000 rxn	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Herculase II 5X Rxn Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	dNTPs 100mM	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: DMSO	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Herculase II Fusion Enzyme 30,0000 rxn	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Herculase II 5X Rxn Buffer	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on

Section 6. Accidental release measures

		appropriate personal protective equipment.
	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 spilt material. Put on appropriate personal protective equipment.
For emergency responders :	DMSO	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	Herculase II Fusion Enzyme 30,0000 rxn	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	Herculase II 5X Rxn Buffer	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	dNTPs 100mM	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions :	DMSO	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Herculase II Fusion Enzyme 30,0000 rxn	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Herculase II 5X Rxn Buffer	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	dNTPs 100mM	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Methods for cleaning up :	DMSO	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	Herculase II Fusion Enzyme 30,0000 rxn	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	Herculase II 5X Rxn Buffer	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an

Section 6. Accidental release measures

	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 vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.
Herculase II Fusion Enzyme 30,0000 rxn	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Herculase II 5X Rxn Buffer	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour 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.
dNTPs 100mM	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 30,0000 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

Section 7. Handling and storage

		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.
Conditions for safe storage, including any incompatibilities :	DMSO	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 oxidising 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Herculase II Fusion Enzyme 30,0000 rxn	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Herculase II 5X Rxn Buffer	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 unlabelled 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
DMSO Dimethyl sulfoxide	**DFG MAC-values list (Germany, 7/2023). Absorbed through skin.** PEAK: 320 mg/m³, 4 times per shift, 15 minutes. TWA: 160 mg/m³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours.
Herculase II Fusion Enzyme 30,0000 rxn Glycerol	**Safe Work Australia (Australia, 10/2022).** TWA: 10 mg/m³ 8 hours.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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

Individual protection measures

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

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

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

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

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

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 30,0000 rxn	Liquid.
Herculase II 5X Rxn Buffer	Liquid.
dNTPs 100mM	Liquid.

Colour :

DMSO	Colourless.
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Odour :

DMSO	Odourless. [Slight]
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Odour threshold :

DMSO	Not available.
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

pH :

DMSO	Not available.
Herculase II Fusion Enzyme 30,0000 rxn	8.2
Herculase II 5X Rxn Buffer	9.5 to 10.5
dNTPs 100mM	7.5

Melting point/freezing point :

DMSO	18.5°C (65.3°F)
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Boiling point, initial boiling point, and boiling range :

DMSO	189°C (372.2°F)
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Flash point :

DMSO	Closed cup: 87°C (188.6°F) [ASTM D 93] Open cup: 87°C (188.6°F)
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

	Closed cup			Open cup		
Ingredient name	**°C**	**°F**	**Method**	**°C**	**°F**	**Method**
Herculase II Fusion Enzyme 30,0000 rxn						
Glycerol	-	-	-	177	350.6	-

Evaporation rate :

DMSO	0.026 (butyl acetate = 1)
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Section 9. Physical and chemical properties and safety characteristics

Flammability :

DMSO	Not applicable.
Herculase II Fusion Enzyme 30,0000 rxn	Not applicable.
Herculase II 5X Rxn Buffer	Not applicable.
dNTPs 100mM	Not applicable.

Lower and upper explosion limit/flammability limit :

DMSO	Lower: 2.6% Upper: 28.5%
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

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

Ingredient name	Vapour Pressure at 20˚C			Vapour pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Herculase II Fusion Enzyme 30,0000 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	-
dNTPs 100mM						
water	17.5	2.3	-	92.258	12.3	-

Relative vapour density :

DMSO	2.7 [Air = 1]
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Relative density :

DMSO	1.1
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Solubility(ies) :

Media	Result
DMSO	
water	Soluble
Herculase II Fusion Enzyme 30,0000 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 30,0000 rxn	Not applicable.
Herculase II 5X Rxn Buffer	Not applicable.
dNTPs 100mM	Not applicable.

Section 9. Physical and chemical properties and safety characteristics

Auto-ignition temperature :

DMSO	300 to 302°C (572 to 575.6°F)		
Ingredient name	**°C**	**°F**	**Method**
Herculase II Fusion Enzyme 30,0000 rxn			
Glycerol	370	698	-

Decomposition temperature :

DMSO	140 to 189°C (284 to 372.2°F)
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Viscosity :

DMSO	Dynamic: 2.14 mPa·s (2.14 cP)
Herculase II Fusion Enzyme 30,0000 rxn	Not available.
Herculase II 5X Rxn Buffer	Not available.
dNTPs 100mM	Not available.

Particle characteristics

Median particle size :

DMSO	Not applicable.
Herculase II Fusion Enzyme 30,0000 rxn	Not applicable.
Herculase II 5X Rxn Buffer	Not applicable.
dNTPs 100mM	Not applicable.

Section 10. Stability and reactivity

Reactivity :

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

Chemical stability :

DMSO	The product is stable.
Herculase II Fusion Enzyme 30,0000 rxn	The product is stable.
Herculase II 5X Rxn Buffer	Shelf life: 1 Year.
dNTPs 100mM	Shelf life: 1 Year.

Possibility of hazardous reactions :

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

Conditions to avoid :

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

Section 10. Stability and reactivity

Incompatible materials :

DMSO	Reactive or incompatible with the following materials: oxidising materials
Herculase II Fusion Enzyme 30,0000 rxn	May react or be incompatible with oxidising materials.
Herculase II 5X Rxn Buffer	May react or be incompatible with oxidising materials.
dNTPs 100mM	May react or be incompatible with oxidising materials.

Hazardous decomposition products :

DMSO	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Herculase II Fusion Enzyme 30,0000 rxn	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Herculase II 5X Rxn Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
dNTPs 100mM	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	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Herculase II Fusion Enzyme 30,0000 rxn				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Herculase II 5X Rxn Buffer				
Hexadecan-1-ol, ethoxylated	LD50 Oral	Rat	2500 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
DMSO					
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Herculase II Fusion Enzyme 30,0000 rxn					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-

Sensitisation

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Section 11. Toxicological information

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure :

DMSO	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
Herculase II Fusion Enzyme 30,0000 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 30,0000 rxn	Causes eye irritation.
Herculase II 5X Rxn Buffer	Causes serious eye irritation.
dNTPs 100mM	No known significant effects or critical hazards.

Inhalation :

DMSO	No known significant effects or critical hazards.
Herculase II Fusion Enzyme 30,0000 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 30,0000 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 30,0000 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 30,0000 rxn	Adverse symptoms may include the following: irritation watering redness
Herculase II 5X Rxn Buffer	Adverse symptoms may include the following: pain or irritation watering redness
dNTPs 100mM	No specific data.

Section 11. Toxicological information

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

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	:	DMSO	No known significant effects or critical hazards.
		Herculase II Fusion Enzyme 30,0000 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 30,0000 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 30,0000 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 30,0000 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

Section 11. Toxicological information

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
DMSO					
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Herculase II Fusion Enzyme 30,0000 rxn					
Glycerol	12600	N/A	N/A	N/A	N/A
Herculase II 5X Rxn Buffer					
Herculase II 5X Rxn Buffer	52350	N/A	N/A	N/A	N/A
Hexadecan-1-ol, ethoxylated	500	N/A	N/A	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
DMSO			
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 ul/L Marine water	Algae - *Ulva lactuca*	72 hours
	Chronic NOEC 100 ul/L Fresh water	Daphnia - *Daphnia magna* - Juvenile (Fledgling, Hatchling, Weanling)	21 days
Herculase II Fusion Enzyme 30,0000 rxn			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - *Oncorhynchus mykiss*	96 hours
Herculase II 5X Rxn Buffer			
Hexadecan-1-ol, ethoxylated	Acute LC50 330000 to 1000000 µg/l Marine water	Crustaceans - *Crangon crangon* - 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 30,0000 rxn				
Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-

Section 12. Ecological information

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

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
DMSO Dimethyl sulfoxide	-1.35	3.16	Low
Herculase II Fusion Enzyme 30,0000 rxn Glycerol	-1.76	-	Low
Herculase II 5X Rxn Buffer 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 minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

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

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

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

Standard for the Uniform Scheduling of Medicines and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

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.

New Zealand : Not determined.

United States : Not determined.

Section 16. Any other relevant information

History

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

Date of previous issue : 29/03/2021

Version : 3

Key to abbreviations : ADG = Australian Dangerous Goods
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
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
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
DMSO	
FLAMMABLE LIQUIDS - Category 4	On basis of test data
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B	On basis of test data
Herculase II Fusion Enzyme 30,0000 rxn	
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B	Calculation method
Herculase II 5X Rxn Buffer	

Section 16. Any other relevant information

SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A	Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

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