

SAFETY DATA SHEET



miRNA Labeling Kit, Part Number 5190-0431

Section 1. Identification

Product identifier	: miRNA Labeling Kit, Part Number 5190-0431
Part No. (Chemical Kit)	: 5190-0431
Part No.	: Nuclease Free Water 5190-0425
	DMSO 5190-0428
	10X Calf Intestinal Phosphatase Buffer 5190-0426
	Calf Intestinal Phosphatase 5190-0427
	10X T4 RNA Ligase Buffer 5190-0429
	T4 RNA Ligase 5190-0430

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

Analytical reagent.

Nuclease Free Water	0.45 ml
DMSO	0.18 ml
10X Calf Intestinal Phosphatase Buffer	0.09 ml
Calf Intestinal Phosphatase	0.022 ml
10X T4 RNA Ligase Buffer	0.09 ml
T4 RNA Ligase	0.027 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

Calf Intestinal Phosphatase

H401 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2
H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

10X Calf Intestinal Phosphatase Buffer	Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10% Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 1 - 10% Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 1 - 10%
Calf Intestinal Phosphatase	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%
10X T4 RNA Ligase Buffer	Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10% Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30% Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 1 - 10%
T4 RNA Ligase	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%

Section 2. Hazard(s) identification

10X Calf Intestinal Phosphatase Buffer
10X T4 RNA Ligase Buffer

Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 7.9%
Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 7.9%

GHS label elements

Signal word

: 10X Calf Intestinal Phosphatase Buffer
DMSO
10X Calf Intestinal Phosphatase Buffer
Calf Intestinal Phosphatase
10X T4 RNA Ligase Buffer
T4 RNA Ligase

No signal word.
WARNING
No signal word.
No signal word.
No signal word.
No signal word.

Hazard statements

: 10X Calf Intestinal Phosphatase Buffer
DMSO
10X Calf Intestinal Phosphatase Buffer
Calf Intestinal Phosphatase
10X T4 RNA Ligase Buffer
T4 RNA Ligase

No known significant effects or critical hazards.
H227 - Combustible liquid.
No known significant effects or critical hazards.
H401 - Toxic to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Precautionary statements

Prevention

: 10X Calf Intestinal Phosphatase Buffer
DMSO
10X Calf Intestinal Phosphatase Buffer
Calf Intestinal Phosphatase
10X T4 RNA Ligase Buffer
T4 RNA Ligase

Not applicable.
P280 - Wear protective gloves. Wear eye or face protection.
P210 - Keep away from flames and hot surfaces. - No smoking.
Not applicable.
P273 - Avoid release to the environment.
Not applicable.
Not applicable.

Response

: 10X Calf Intestinal Phosphatase Buffer
DMSO
10X Calf Intestinal Phosphatase Buffer
Calf Intestinal Phosphatase
10X T4 RNA Ligase Buffer
T4 RNA Ligase

Not applicable.
Not applicable.
Not applicable.
Not applicable.
Not applicable.
Not applicable.

Storage

: 10X Calf Intestinal Phosphatase Buffer
DMSO
10X Calf Intestinal Phosphatase Buffer
Calf Intestinal Phosphatase
10X T4 RNA Ligase Buffer
T4 RNA Ligase

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

Disposal

: 10X Calf Intestinal Phosphatase Buffer
DMSO
10X Calf Intestinal Phosphatase Buffer
Calf Intestinal Phosphatase
10X T4 RNA Ligase Buffer
T4 RNA Ligase

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

Section 2. Hazard(s) identification

Supplemental label elements	<input checked="" type="checkbox"/> Nuclease Free Water	Not applicable.
	DMSO	Not applicable.
	10X Calf Intestinal Phosphatase Buffer	Not applicable.
	Calf Intestinal Phosphatase	Not applicable.
	10X T4 RNA Ligase Buffer	Not applicable.
	T4 RNA Ligase	Not applicable.

Other hazards which do not result in classification	<input checked="" type="checkbox"/> Nuclease Free Water	None known.
	DMSO	None known.
	10X Calf Intestinal Phosphatase Buffer	None known.
	Calf Intestinal Phosphatase	None known.
	10X T4 RNA Ligase Buffer	None known.
	T4 RNA Ligase	None known.

Section 3. Composition and ingredient information

Substance/mixture	<input checked="" type="checkbox"/> Nuclease Free Water	substance
	DMSO	Substance
	10X Calf Intestinal Phosphatase Buffer	Mixture
	Calf Intestinal Phosphatase	Mixture
	10X T4 RNA Ligase Buffer	Mixture
	T4 RNA Ligase	Mixture

CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
<input checked="" type="checkbox"/> Nuclease Free Water Water	100.000000000	7732-18-5
DMSO Dimethyl sulfoxide	100.000000000	67-68-5
Calf Intestinal Phosphatase Glycerol	≥30 - ≤60	56-81-5
Zinc chloride	<1	7646-85-7
T4 RNA Ligase Glycerol	≥30 - ≤60	56-81-5

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

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

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	<input checked="" type="checkbox"/> Nuclease Free Water	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.
	DMSO	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
	10X Calf Intestinal Phosphatase Buffer	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get

Section 4. First aid measures

	Calf Intestinal Phosphatase	medical attention if irritation occurs. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
	10X T4 RNA Ligase 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.
	T4 RNA Ligase	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	: Nuclease Free Water	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	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.
	10X Calf Intestinal Phosphatase 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.
	Calf Intestinal Phosphatase	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.
	10X T4 RNA Ligase 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.
	T4 RNA Ligase	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Skin contact	: Nuclease Free Water	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	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.
	10X Calf Intestinal Phosphatase Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get

Section 4. First aid measures

	Calf Intestinal Phosphatase	medical attention if symptoms occur. 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.
	10X T4 RNA Ligase Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	T4 RNA Ligase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	: Nuclease Free Water	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	DMSO	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	10X Calf Intestinal Phosphatase Buffer	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	Calf Intestinal Phosphatase	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	10X T4 RNA Ligase Buffer	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical

Section 4. First aid measures

T4 RNA Ligase

attention if symptoms occur.

Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Inhalation	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Skin contact	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Ingestion	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No specific data. No specific data. No specific data. No specific data. No specific data. No specific data.
Inhalation	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No specific data. No specific data. No specific data. No specific data. No specific data. No specific data.

Section 4. First aid measures

Skin contact	:	Nuclease Free Water	No specific data.
		DMSO	No specific data.
		10X Calf Intestinal Phosphatase Buffer	No specific data.
		Calf Intestinal Phosphatase	No specific data.
		10X T4 RNA Ligase Buffer	No specific data.
		T4 RNA Ligase	No specific data.
Ingestion	:	Nuclease Free Water	No specific data.
		DMSO	No specific data.
		10X Calf Intestinal Phosphatase Buffer	No specific data.
		Calf Intestinal Phosphatase	No specific data.
		10X T4 RNA Ligase Buffer	No specific data.
		T4 RNA Ligase	No specific data.

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

Notes to physician	:	Nuclease Free Water	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		DMSO	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		10X Calf Intestinal Phosphatase 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.
		Calf Intestinal Phosphatase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		10X T4 RNA Ligase 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.
		T4 RNA Ligase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	Nuclease Free Water	No specific treatment.
		DMSO	No specific treatment.
		10X Calf Intestinal Phosphatase Buffer	No specific treatment.
		Calf Intestinal Phosphatase	No specific treatment.
		10X T4 RNA Ligase Buffer	No specific treatment.
		T4 RNA Ligase	No specific treatment.
Protection of first-aiders	:	Nuclease Free Water	No action shall be taken involving any personal risk or without suitable training.
		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.
		10X Calf Intestinal Phosphatase Buffer	No action shall be taken involving any personal risk or without suitable training.
		Calf Intestinal Phosphatase	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.
		10X T4 RNA Ligase Buffer	No action shall be taken involving any personal risk or without suitable training.
		T4 RNA Ligase	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

: Nuclease Free Water	Use an extinguishing agent suitable for the surrounding fire.
DMSO	Use dry chemical, CO ₂ , water spray (fog) or foam.
10X Calf Intestinal Phosphatase Buffer	Use an extinguishing agent suitable for the surrounding fire.
Calf Intestinal Phosphatase	Use an extinguishing agent suitable for the surrounding fire.
10X T4 RNA Ligase Buffer	Use an extinguishing agent suitable for the surrounding fire.
T4 RNA Ligase	Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media

: Nuclease Free Water	None known.
DMSO	Do not use water jet.
10X Calf Intestinal Phosphatase Buffer	None known.
Calf Intestinal Phosphatase	None known.
10X T4 RNA Ligase Buffer	None known.
T4 RNA Ligase	None known.

Specific hazards arising from the chemical

: Nuclease Free Water	In a fire or if heated, a pressure increase will occur and the container may burst.
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.
10X Calf Intestinal Phosphatase Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
Calf Intestinal Phosphatase	In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
10X T4 RNA Ligase Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
T4 RNA Ligase	In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products



: Nuclease Free Water	No specific data.
DMSO	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
10X Calf Intestinal Phosphatase Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds
Calf Intestinal Phosphatase	Decomposition products may include the following materials: carbon dioxide carbon monoxide
10X T4 RNA Ligase Buffer	Decomposition products may include the following materials:

Section 5. Firefighting measures

		carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds metal oxide/oxides
	T4 RNA Ligase	Decomposition products may include the following materials: carbon dioxide carbon monoxide
Special protective actions for fire-fighters	: Nuclease Free Water	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.
	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.
	10X Calf Intestinal Phosphatase 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.
	Calf Intestinal Phosphatase	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.
	10X T4 RNA Ligase 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.
	T4 RNA Ligase	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	: Nuclease Free Water	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	DMSO	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	10X Calf Intestinal Phosphatase Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Calf Intestinal Phosphatase	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	10X T4 RNA Ligase Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	T4 RNA Ligase	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	:  Nuclease Free Water	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.
	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.
	10X Calf Intestinal Phosphatase 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. Put on appropriate personal protective equipment.
	Calf Intestinal Phosphatase	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.
	10X T4 RNA Ligase 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. Put on appropriate personal protective equipment.
	T4 RNA Ligase	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	:  Nuclease Free Water	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".
	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".
	10X Calf Intestinal Phosphatase 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".
	Calf Intestinal Phosphatase	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".
	10X T4 RNA Ligase 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

Section 6. Accidental release measures

T4 RNA Ligase

information in "For non-emergency personnel". 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 :  Nuclease Free Water

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).

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).

10X Calf Intestinal Phosphatase 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).

Calf Intestinal Phosphatase

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

10X T4 RNA Ligase 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).

T4 RNA Ligase

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 :  Nuclease Free Water

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.

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.

10X Calf Intestinal Phosphatase 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.

Calf Intestinal Phosphatase

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.

Section 6. Accidental release measures

10X T4 RNA Ligase Buffer	disposal container. Dispose of via a licensed waste disposal contractor. Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
T4 RNA Ligase	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

: Nuclease Free Water	Put on appropriate personal protective equipment (see Section 8).
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.
10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase	Put on appropriate personal protective equipment (see Section 8). Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
10X T4 RNA Ligase Buffer	Put on appropriate personal protective equipment (see Section 8).
T4 RNA Ligase	Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene

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

Section 7. Handling and storage

10X Calf Intestinal Phosphatase 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.
Calf Intestinal Phosphatase	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.
10X T4 RNA Ligase 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.
T4 RNA Ligase	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 : Nuclease Free Water

DMSO	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. Storage temperature: -20°C (-4°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
10X Calf Intestinal Phosphatase Buffer	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid

Section 7. Handling and storage

Calf Intestinal Phosphatase

environmental contamination. See Section 10 for incompatible materials before handling or use. 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.

10X T4 RNA Ligase Buffer

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

T4 RNA Ligase

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

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
DMSO Dimethyl sulfoxide	DFG MAC-values list (Germany, 7/2015). Absorbed through skin. PEAK: 320 mg/m ³ , 4 times per shift, 15 minutes. TWA: 160 mg/m ³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours.
Calf Intestinal Phosphatase Glycerol Zinc chloride	Safe Work Australia (Australia, 1/2014). TWA: 10 mg/m ³ 8 hours. Safe Work Australia (Australia, 1/2014). STEL: 2 mg/m ³ 15 minutes. Form: Fume TWA: 1 mg/m ³ 8 hours. Form: Fume
T4 RNA Ligase Glycerol	Safe Work Australia (Australia, 1/2014). TWA: 10 mg/m ³ 8 hours.

Section 8. Exposure controls and personal protection

- 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

- Physical state**
- | | |
|--|------------------|
| Nuclease Free Water | Liquid. |
| DMSO | Liquid. [Clear.] |
| 10X Calf Intestinal Phosphatase Buffer | Liquid. |
| Calf Intestinal Phosphatase | Liquid. |
| 10X T4 RNA Ligase Buffer | Liquid. |
| T4 RNA Ligase | Liquid. |
- Colour**
- | | |
|--|----------------|
| Nuclease Free Water | Colourless. |
| DMSO | Colourless. |
| 10X Calf Intestinal Phosphatase Buffer | Not available. |
| Calf Intestinal Phosphatase | Not available. |
| 10X T4 RNA Ligase Buffer | Not available. |
| T4 RNA Ligase | Not available. |

Section 9. Physical and chemical properties

Odour	: Nuclease Free Water	Odourless.
	DMSO	Odourless. [Slight]
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
Odour threshold	: Nuclease Free Water	Not available.
	DMSO	Not available.
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
pH	: Nuclease Free Water	Not available.
	DMSO	Not available.
	10X Calf Intestinal Phosphatase Buffer	9
	Calf Intestinal Phosphatase	8
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	7.5
Melting point	: Nuclease Free Water	0°C (32°F)
	DMSO	18.5°C (65.3°F)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
Boiling point	: Nuclease Free Water	100°C (212°F)
	DMSO	189°C (372.2°F)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
Flash point	: Nuclease Free Water	Not available.
	DMSO	Closed cup: 87°C (188.6°F) Open cup: 87°C (188.6°F)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
Evaporation rate	: Nuclease Free Water	Not available.
	DMSO	0.026 (butyl acetate = 1)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
Flammability (solid, gas)	: Nuclease Free Water	Not applicable.
	DMSO	Not applicable.
	10X Calf Intestinal Phosphatase Buffer	Not applicable.
	Calf Intestinal Phosphatase	Not applicable.
	10X T4 RNA Ligase Buffer	Not applicable.
	T4 RNA Ligase	Not applicable.

Section 9. Physical and chemical properties

Lower and upper explosive (flammable) limits	: Nuclease Free Water	Not available.
	DMSO	Lower: 2.6% Upper: 28.5%
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.
Vapour pressure	: Nuclease Free Water	Not available.
	DMSO	0.056 kPa (0.42 mm Hg) [room temperature]
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.
Vapour density	: Nuclease Free Water	Not available.
	DMSO	2.7 [Air = 1]
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.
Relative density	: Nuclease Free Water	1
	DMSO	1.1
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.
Solubility	: Nuclease Free Water	Easily soluble in the following materials: cold water and hot water.
	DMSO	Easily soluble in the following materials: cold water and hot water.
	10X Calf Intestinal Phosphatase Buffer	Easily soluble in the following materials: cold water and hot water.
	Calf Intestinal Phosphatase	Soluble in the following materials: cold water and hot water.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Easily soluble in the following materials: cold water and hot water. Soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: Nuclease Free Water	Not available.
	DMSO	-1.35
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.
Auto-ignition temperature	: Nuclease Free Water	Not available.
	DMSO	300 to 302°C (572 to 575.6°F)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.
Decomposition temperature	: Nuclease Free Water	>1200°C (>2192°F)
	DMSO	140 to 189°C (284 to 372.2°F)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available.

Section 9. Physical and chemical properties

Viscosity	: Nuclease Free Water	Not available.
	DMSO	Dynamic (room temperature): 2.14 mPa·s (2.14 cP)
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.

Section 10. Stability and reactivity

Reactivity	: Nuclease Free Water	No specific test data related to reactivity available for this product or its ingredients.
	DMSO	No specific test data related to reactivity available for this product or its ingredients.
	10X Calf Intestinal Phosphatase Buffer	No specific test data related to reactivity available for this product or its ingredients.
	Calf Intestinal Phosphatase	No specific test data related to reactivity available for this product or its ingredients.
	10X T4 RNA Ligase Buffer	No specific test data related to reactivity available for this product or its ingredients.
	T4 RNA Ligase	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: Nuclease Free Water	The product is stable.
	DMSO	The product is stable.
	10X Calf Intestinal Phosphatase Buffer	The product is stable.
	Calf Intestinal Phosphatase	The product is stable.
	10X T4 RNA Ligase Buffer	The product is stable.
	T4 RNA Ligase	The product is stable.
Possibility of hazardous reactions	: Nuclease Free Water	Under normal conditions of storage and use, hazardous reactions will not occur.
	DMSO	Under normal conditions of storage and use, hazardous reactions will not occur.
	10X Calf Intestinal Phosphatase Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
	Calf Intestinal Phosphatase	Under normal conditions of storage and use, hazardous reactions will not occur.
	10X T4 RNA Ligase Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
	T4 RNA Ligase	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Nuclease Free Water	No specific data.
	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.
	10X Calf Intestinal Phosphatase Buffer	No specific data.
	Calf Intestinal Phosphatase	No specific data.
	10X T4 RNA Ligase Buffer	No specific data.
	T4 RNA Ligase	No specific data.

Section 10. Stability and reactivity

Incompatible materials	:	<input checked="" type="checkbox"/> Nuclease Free Water	May react or be incompatible with oxidising materials.
		DMSO	Reactive or incompatible with the following materials: oxidizing materials
		10X Calf Intestinal Phosphatase Buffer	May react or be incompatible with oxidising materials.
		Calf Intestinal Phosphatase	May react or be incompatible with oxidising materials.
		10X T4 RNA Ligase Buffer	May react or be incompatible with oxidising materials.
Hazardous decomposition products	:	<input checked="" type="checkbox"/> Nuclease Free Water	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		DMSO	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		10X Calf Intestinal Phosphatase Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		Calf Intestinal Phosphatase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		10X T4 RNA Ligase Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		T4 RNA Ligase	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
<input checked="" type="checkbox"/> DMSO Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Calf Intestinal Phosphatase Glycerol Zinc chloride	LD50 Oral	Rat	12600 mg/kg	-
	LD50 Oral	Rat	350 mg/kg	-
T4 RNA Ligase Glycerol	LD50 Oral	Rat	12600 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<input checked="" type="checkbox"/> DMSO Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
Calf Intestinal Phosphatase Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-

Section 11. Toxicological information

Zinc chloride T4 RNA Ligase Glycerol	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Severe irritant	Rabbit	-	120 hours 1 Percent	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-

Sensitisation

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

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	<input checked="" type="checkbox"/> Nuclease Free Water	Not available.
	DMSO	Routes of entry anticipated: Oral, Dermal, Inhalation.
	10X Calf Intestinal Phosphatase Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation.
	Calf Intestinal Phosphatase	Routes of entry anticipated: Oral, Dermal, Inhalation.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact	<input checked="" type="checkbox"/> Nuclease Free Water	No known significant effects or critical hazards.
	DMSO	No known significant effects or critical hazards.
	10X Calf Intestinal Phosphatase Buffer	No known significant effects or critical hazards.
	Calf Intestinal Phosphatase	No known significant effects or critical hazards.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards.
Inhalation	<input checked="" type="checkbox"/> Nuclease Free Water	No known significant effects or critical hazards.
	DMSO	No known significant effects or critical hazards.
	10X Calf Intestinal Phosphatase Buffer	No known significant effects or critical hazards.
	Calf Intestinal Phosphatase	No known significant effects or critical hazards.
	10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards.

Section 11. Toxicological information

Skin contact	:	Nuclease Free Water	No known significant effects or critical hazards.
		DMSO	No known significant effects or critical hazards.
		10X Calf Intestinal Phosphatase Buffer	No known significant effects or critical hazards.
		Calf Intestinal Phosphatase	No known significant effects or critical hazards.
		10X T4 RNA Ligase Buffer	No known significant effects or critical hazards.
		T4 RNA Ligase	No known significant effects or critical hazards.
Ingestion	:	Nuclease Free Water	No known significant effects or critical hazards.
		DMSO	No known significant effects or critical hazards.
		10X Calf Intestinal Phosphatase Buffer	No known significant effects or critical hazards.
		Calf Intestinal Phosphatase	No known significant effects or critical hazards.
		10X T4 RNA Ligase Buffer	No known significant effects or critical hazards.
		T4 RNA Ligase	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	:	Nuclease Free Water	No specific data.
		DMSO	No specific data.
		10X Calf Intestinal Phosphatase Buffer	No specific data.
		Calf Intestinal Phosphatase	No specific data.
		10X T4 RNA Ligase Buffer	No specific data.
		T4 RNA Ligase	No specific data.
Inhalation	:	Nuclease Free Water	No specific data.
		DMSO	No specific data.
		10X Calf Intestinal Phosphatase Buffer	No specific data.
		Calf Intestinal Phosphatase	No specific data.
		10X T4 RNA Ligase Buffer	No specific data.
		T4 RNA Ligase	No specific data.
Skin contact	:	Nuclease Free Water	No specific data.
		DMSO	No specific data.
		10X Calf Intestinal Phosphatase Buffer	No specific data.
		Calf Intestinal Phosphatase	No specific data.
		10X T4 RNA Ligase Buffer	No specific data.
		T4 RNA Ligase	No specific data.
Ingestion	:	Nuclease Free Water	No specific data.
		DMSO	No specific data.
		10X Calf Intestinal Phosphatase Buffer	No specific data.
		Calf Intestinal Phosphatase	No specific data.
		10X T4 RNA Ligase Buffer	No specific data.
		T4 RNA Ligase	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

Not available.

Section 11. Toxicological information

General	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Carcinogenicity	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Mutagenicity	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Teratogenicity	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Developmental effects	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Fertility effects	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
10X T4 RNA Ligase Buffer Oral	32467.5 mg/kg

Section 12. Ecological information

Toxicity

Section 12. Ecological information

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 µl/L Marine water	Algae - Ulva lactuca	72 hours
Calf Intestinal Phosphatase Glycerol Zinc chloride	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Acute EC50 26 µg/l	Algae - Navicula incerta	96 hours
	Acute EC50 34 µg/l Fresh water	Algae - Chlorella vulgaris - Exponential growth phase	72 hours
	Acute EC50 1.8 mg/l Fresh water	Aquatic plants - Lemna aequinoctialis	96 hours
	Acute EC50 100 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 49.99 µg/l Fresh water	Crustaceans - Moina irrasa - Neonate	48 hours
	Acute LC50 0.027 mg/l Marine water	Fish - Limanda punctatissima - Pre-larvae	96 hours
	Chronic NOEC 20 µg/l Marine water	Algae - Chlorella sp. - Exponential growth phase	72 hours
	Chronic NOEC 1000 µg/l Fresh water	Crustaceans - Procambarus clarkii - Intermolt	21 days
	Chronic NOEC 80 µg/l Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days
T4 RNA Ligase Glycerol	Chronic NOEC 31.5 µg/l Fresh water	Fish - Oncorhynchus mykiss	30 days
	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Nuclease Free Water Water	-	100 % - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Nuclease Free Water Water	-	-	Readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Nuclease Free Water Water	-1.38	-	low
DMSO Dimethyl sulfoxide	-1.35	3.16	low
Calf Intestinal Phosphatase Glycerol Zinc chloride	-1.76	-	low
	-	60960	high
T4 RNA Ligase Glycerol	-1.76	-	low

Mobility in soil

Section 12. Ecological information

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. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

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

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

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

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

<u>Ingredient name</u>	<u>Schedule</u>
<input checked="" type="checkbox"/> Calf Intestinal Phosphatase zinc chloride	Prohibited

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : Not determined.

Canada : Not determined.

Section 15. Regulatory information

China	: Not determined.
Europe	: All components are listed or exempted.
Japan	: <input checked="" type="checkbox"/> Japan inventory (ENCS) : Not determined. Japan inventory (ISHL) : Not determined.
Malaysia	: Not determined.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: Not determined.
Taiwan	: All components are listed or exempted.
Thailand	: <input checked="" type="checkbox"/> Not determined.
Turkey	: <input checked="" type="checkbox"/> Not determined.
United States	: <input checked="" type="checkbox"/> All components are listed or exempted.
Viet Nam	: <input checked="" type="checkbox"/> Not determined.

Section 16. Any other relevant information

History

Date of issue/Date of revision	: 23/06/2017
Date of previous issue	: 30/06/2015.
Version	: 4

Key to abbreviations

: ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
<input checked="" type="checkbox"/> DMSO Flam. Liq. 4, H227	On basis of test data
Calf Intestinal Phosphatase Aquatic Acute 2, H401 Aquatic Chronic 3, H412	Calculation method Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

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