

SAFETY DATA SHEET

miRNA Labeling Kit

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	: miRNA Labeling Kit	
CAS number	: Nuclease- Free Water	7732-18-5
	: DMSO	67-68-5
	: 10X Calf Intestinal Phosphatase Buffer	Not applicable.
	: Calf Intestinal Phosphatase	Not applicable.
	: 10X T4 RNA Ligase Buffer	Not applicable.
	: T4 RNA Ligase	Not applicable.
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

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

Identified uses	: 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
Uses advised against	: None known.	

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +353 1 901 4670

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

SECTION 2: Hazards identification

Product definition	:	Nuclease- Free Water	Mono-constituent substance
		DMSO	Mono-constituent substance
		10X Calf Intestinal Phosphatase Buffer	Mixture
		Calf Intestinal Phosphatase	Mixture
		10X T4 RNA Ligase Buffer	Mixture
		T4 RNA Ligase	Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Calf Intestinal Phosphatase

H412	LONG-TERM (CHRONIC) AQUATIC HAZARD	Category 3
Nuclease- Free Water	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.	
DMSO	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.	
10X Calf Intestinal Phosphatase Buffer	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.	
Calf Intestinal Phosphatase	The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.	
10X T4 RNA Ligase Buffer	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.	
T4 RNA Ligase	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.	

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

Ingredients of unknown ecotoxicity : 10X T4 RNA Ligase Buffer Contains 2% of components with unknown hazards to the aquatic environment

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Signal word	:	Nuclease- Free Water	No signal word.
		DMSO	No signal word.
		10X Calf Intestinal Phosphatase Buffer	No signal word.
		Calf Intestinal Phosphatase	No signal word.
		10X T4 RNA Ligase Buffer	No signal word.
		T4 RNA Ligase	No signal word.

Hazard statements	:	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	H412 - Harmful to aquatic life with long lasting effects.
		10X T4 RNA Ligase Buffer	No known significant effects or critical hazards.
		T4 RNA Ligase	No known significant effects or critical hazards.

Precautionary statements

miRNA Labeling Kit

SECTION 2: Hazards identification

Prevention	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Not applicable. Not applicable. Not applicable. P273 - Avoid release to the environment. Not applicable. Not applicable.
Response	:	Nuclease- Free Water 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	:	Nuclease- Free Water 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.
Disposal	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Not applicable. Not applicable. Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable. Not applicable.
Supplemental label elements	:	Nuclease- Free Water 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. Safety data sheet available on request. Contains 2-mercaptoethanol. May produce an allergic reaction. Safety data sheet available on request.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	:	Nuclease- Free Water 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.

[Special packaging requirements](#)

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SECTION 2: Hazards identification

Tactile warning of danger	:	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.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

	PBT	P	B	T	vPvB	vP	vB
Nuclease-Free Water							
Not applicable (Inorganic)		N/A	N/A	N/A	Not applicable (Inorganic)	N/A	N/A
DMSO							
No		N/A	No	No	No	N/A	No

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

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
 This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
 This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
 This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification

:	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/information on ingredients

3.1 Substances

:	Nuclease- Free Water	Mono-constituent substance
	DMSO	Mono-constituent substance
	10X Calf Intestinal Phosphatase Buffer	Mixture
	Calf Intestinal Phosphatase	Mixture
	10X T4 RNA Ligase Buffer	Mixture
	T4 RNA Ligase	Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
Nuclease- Free Water water	REACH #: Annex IV EC: 231-791-2 CAS: 7732-18-5	100	Not classified.	-	[1]
DMSO dimethyl sulfoxide	EC: 200-664-3 CAS: 67-68-5	100	Not classified.	-	[1]

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SECTION 3: Composition/information on ingredients

Calf Intestinal Phosphatase					
glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	-	[2]
zinc chloride	EC: 231-592-0 CAS: 7646-85-7 Index: 030-003-00-2	<1	Acute Tox. 4, H302 Skin Corr. 1B, H314 STOT SE 3, H335 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 350 mg/kg STOT SE 3, H335: C ≥ 5% M [Acute] = 10 M [Chronic] = 1	[1] [2]
10X T4 RNA Ligase Buffer					
(R*,R*) -1,4-dimercaptobutane-2,3-diol	EC: 222-468-7 CAS: 3483-12-3	≤3	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 3, H412	ATE [Oral] = 500 mg/kg	[1]
T4 RNA Ligase					
glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	-	[2]
2-mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	<0.1	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 3, H331 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1A, H317 Repr. 2, H361f STOT RE 2, H373 (heart, liver) Aquatic Acute 1, H400 Aquatic Chronic 2, H411 See Section 16 for the full text of the H statements declared above.	ATE [Oral] = 244 mg/kg ATE [Dermal] = 200 mg/kg ATE [Inhalation (vapours)] = 3 mg/l M [Acute] = 1	[1]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type	
Nuclease- Free Water	[1] Constituent
DMSO	[1] Constituent
Calf Intestinal Phosphatase	[1] Substance classified with a health or environmental hazard [2] Substance with a workplace exposure limit
10X T4 RNA Ligase Buffer	[1] Substance classified with a health or environmental hazard
T4 RNA Ligase	[1] Substance classified with a health or environmental hazard [2] Substance with a workplace exposure limit

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

SECTION 4: First aid measures**4.1 Description of first aid measures**

Eye contact	: 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. 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 medical attention if irritation occurs.
	Calf Intestinal Phosphatase	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.
	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. Get medical attention if symptoms occur.
	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.
	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.
	10X Calf Intestinal Phosphatase Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Calf Intestinal Phosphatase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	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.

SECTION 4: First aid measures

Ingestion	: Nuclease- Free Water	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.
	DMSO	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.
	10X Calf Intestinal Phosphatase Buffer	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.
	Calf Intestinal Phosphatase	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.
	10X T4 RNA Ligase Buffer	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.
	T4 RNA Ligase	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.
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.
	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.
	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.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye 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.
Inhalation	: 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.

SECTION 4: First aid measures

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.	

Over-exposure signs/symptoms

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.	

4.3 Indication of any immediate medical attention and special treatment needed

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SECTION 4: First aid measures

Notes to physician	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. 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. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. 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. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	None known. None known. None known. None known. None known. None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. 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. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst.
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SECTION 5: Firefighting measures

Hazardous combustion 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: 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

5.3 Advice for firefighters

Special precautions 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.
	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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	DMSO	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a

SECTION 5: Firefighting measures

Calf Intestinal Phosphatase	basic level of protection for chemical incidents. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 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. 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. 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
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-

SECTION 6: Accidental release measures

Calf Intestinal Phosphatase	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".
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 information in "For non-emergency personnel".
T4 RNA Ligase	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".

6.2 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).

6.3 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. 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. Dispose of via a licensed waste disposal contractor.
10X T4 RNA Ligase	Stop leak if without risk. Move containers from spill area.

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SECTION 6: Accidental release measures

Buffer	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.

6.4 Reference to other sections : See Section 1 for emergency contact information.
 See Section 8 for information on appropriate personal protective equipment.
 See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 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).
	10X Calf Intestinal Phosphatase Buffer	Put on appropriate personal protective equipment (see Section 8).
	Calf Intestinal Phosphatase	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.
	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

SECTION 7: Handling and storage

T4 RNA Ligase

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

7.2 Conditions for safe storage, including any incompatibilities

Storage

: Nuclease- Free Water

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.

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.

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

Calf Intestinal Phosphatase

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 7: Handling and storage

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.

7.3 Specific end use(s)

Recommendations	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications.
Industrial sector specific solutions	: Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available. Not available. Not available. Not available. Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Calf Intestinal Phosphatase Glycerol zinc chloride	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 10 mg/m ³ 8 hours. Form: mist NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 1 mg/m ³ 8 hours. Form: fume OELV: 2 mg/m ³ 15 minutes. Form: fume
T4 RNA Ligase Glycerol	NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 10 mg/m ³ 8 hours. Form: mist

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

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SECTION 8: Exposure controls/personal protection

Product/ingredient name	Type	Exposure	Value	Population	Effects
DMSO Dimethyl sulfoxide	DNEL	Long term Oral	1.67 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	3.13 mg/m ³	General population	Local
	DNEL	Long term Inhalation	17.67 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	56 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	75 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	178 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	356 mg/kg bw/day	Workers	Systemic
	T4 RNA Ligase 2-Mercaptoethanol	DNEL	Short term Oral	0.025 mg/kg bw/day	General population
DNEL		Long term Oral	0.025 mg/kg bw/day	General population	Systemic
DNEL		Short term Dermal	0.05 mg/kg bw/day	Workers	Systemic
DNEL		Long term Dermal	0.05 mg/kg bw/day	Workers	Systemic
DNEL		Short term Inhalation	0.17 mg/m ³	Workers	Systemic
DNEL		Long term Inhalation	0.17 mg/m ³	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

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

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.

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SECTION 8: Exposure controls/personal protection

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

SECTION 9: Physical and chemical properties

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Liquid. Liquid. [Clear.] Liquid. Liquid. Liquid. Liquid. Liquid.
Colour	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Colourless. Colourless. Not available. Not available. Not available. Not available. Not available.
Odour	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Odourless. Odourless. [Slight] Not available. Not available. Not available. Not available. Not available.
Odour threshold	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Not available. Not available. Not available. Not available. Not available. Not available.
Melting point/freezing point	:	Nuclease- Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	0°C 18.5°C Not available. Not available. Not available. Not available.

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SECTION 9: Physical and chemical properties

Initial boiling point and boiling range	:	Nuclease- Free Water	100°C
		DMSO	189°C
		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	:	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.
Upper/lower flammability or explosive 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	Not available.
		T4 RNA Ligase	Not available.
Flash point	:	Nuclease- Free Water	Not available.
		DMSO	Closed cup: 87°C [ASTM D 93] Open cup: 87°C
		10X Calf Intestinal Phosphatase Buffer	Not available.
		Calf Intestinal Phosphatase	Not available.
		10X T4 RNA Ligase Buffer	Not available.
		T4 RNA Ligase	Not available.

Ingredient name	Closed cup		Open cup	
	°C	Method	°C	Method
Calf Intestinal Phosphatase glycerol	-	-	177	-
10X T4 RNA Ligase Buffer (R*,R*)-1,4-dimercaptobutane-2,3-diol	>110	-	-	-
T4 RNA Ligase glycerol	-	-	177	-

Auto-ignition temperature : DMSO 300 to 302°C

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SECTION 9: Physical and chemical properties

Ingredient name	°C	Method
Calf Intestinal Phosphatase		
glycerol	370	-
T4 RNA Ligase		
glycerol	370	-

Decomposition temperature : Nuclease- Free Water >1200°C
 DMSO 140 to 189°C
 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

Viscosity : Nuclease- Free Water Not available.
 DMSO Dynamic: 2.14 mPa·s
 10X Calf Intestinal Phosphatase Buffer Not available.
 Calf Intestinal Phosphatase Not available.
 10X T4 RNA Ligase Buffer Not available.
 T4 RNA Ligase Not available.

Solubility(ies) :

Media	Result
Nuclease- Free Water	
water	Soluble
DMSO	
water	Soluble
10X Calf Intestinal Phosphatase Buffer	
water	Soluble
Calf Intestinal Phosphatase	
water	Soluble
10X T4 RNA Ligase Buffer	
water	Soluble
T4 RNA Ligase	
water	Soluble

Partition coefficient: n-octanol/water : Nuclease- Free Water Not applicable.
 DMSO -1.35
 10X Calf Intestinal Phosphatase Buffer Not applicable.
 Calf Intestinal Phosphatase Not applicable.
 10X T4 RNA Ligase Buffer Not applicable.
 T4 RNA Ligase Not applicable.

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

SECTION 9: Physical and chemical properties

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
10X Calf Intestinal Phosphatase Buffer						
water	17.5	2.3	-	92.258	12.3	-
Calf Intestinal Phosphatase						
water	17.5	2.3	-	92.258	12.3	-
glycerol	0.000075	0.00001	-	0.0025	0.00033	-
10X T4 RNA Ligase Buffer						
water	17.5	2.3	-	92.258	12.3	-
T4 RNA Ligase						
water	17.5	2.3	-	92.258	12.3	-
glycerol	0.000075	0.00001	-	0.0025	0.00033	-

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.

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 Not available.
 T4 RNA Ligase 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 Not available.
 T4 RNA Ligase Not available.

miRNA Labeling Kit**SECTION 9: Physical and chemical properties**

Explosive properties	:	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.

Oxidising properties	:	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.

Particle characteristics

Median particle size	:	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.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 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.

10.2 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.

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SECTION 10: Stability and reactivity

10.3 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.

10.4 Conditions to avoid : 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.

10.5 Incompatible materials : Nuclease- Free Water May react or be incompatible with oxidising materials.
 DMSO May react or be incompatible with oxidising 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.
 T4 RNA Ligase May react or be incompatible with oxidising materials.

10.6 Hazardous decomposition products : 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

11.1 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	-
Calf Intestinal Phosphatase zinc chloride	LD50 Oral	Rat	350 mg/kg	-
T4 RNA Ligase 2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-

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SECTION 11: Toxicological information

Acute toxicity estimates

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
Calf Intestinal Phosphatase zinc chloride	350	N/A	N/A	N/A	N/A
10X T4 RNA Ligase Buffer 10X T4 RNA Ligase Buffer (R*,R*)-1,4-Dimercaptobutane-2,3-diol	32467.5 500	N/A N/A	N/A N/A	N/A N/A	N/A N/A
T4 RNA Ligase 2-Mercaptoethanol	244	200	N/A	3	N/A

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	-
Calf Intestinal Phosphatase zinc chloride	Skin - Severe irritant	Rabbit	-	120 hours 1 %	-
T4 RNA Ligase 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Calf Intestinal Phosphatase zinc chloride	Category 3	-	Respiratory tract irritation
10X T4 RNA Ligase Buffer (R*,R*)-1,4-Dimercaptobutane-2,3-diol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

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SECTION 11: Toxicological information

Product/ingredient name	Category	Route of exposure	Target organs
T4 RNA Ligase 2-Mercaptoethanol	Category 2	-	heart, liver

Aspiration hazard

Not available.

Information on likely routes of exposure

Nuclease- Free Water	Not available.
DMSO	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
10X Calf Intestinal Phosphatase Buffer	Not available.
Calf Intestinal Phosphatase	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
10X T4 RNA Ligase Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
T4 RNA Ligase	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation

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.

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.

Eye 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.

Symptoms related to the physical, chemical and toxicological characteristics

SECTION 11: Toxicological information

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. No specific data. No specific data.
Ingestion	:	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. No specific data. No specific data.
Skin 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. No specific data. No specific data.
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. No specific data. 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

Conclusion/Summary : Not available.

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. No known significant effects or critical hazards.
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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. 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. No known significant effects or critical hazards.
Reproductive toxicity	: 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.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

DMSO Adverse symptoms may include the following: kidney abnormalities
 10X T4 RNA Ligase Buffer Adverse symptoms may include the following: May cause skin sensitisation.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
DMSO Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Chronic NOEC 100 ul/L Marine water	Algae - <i>Ulva lactuca</i>	72 hours
	Chronic NOEC 100 ul/L Fresh water	Daphnia - <i>Daphnia magna</i> - Juvenile (Fledgling, Hatchling, Weanling)	21 days
Calf Intestinal Phosphatase zinc chloride	Acute EC50 34 µg/l Fresh water	Algae - <i>Chlorella vulgaris</i> - Exponential growth phase	72 hours
	Acute EC50 26 µg/l Marine water	Algae - <i>Navicula incerta</i>	96 hours
	Acute EC50 1.8 mg/l Fresh water	Aquatic plants - <i>Lemna aequinoctialis</i>	96 hours
	Acute LC50 32 µg/l Fresh water	Crustaceans - <i>Ceriodaphnia reticulata</i>	48 hours
	Acute LC50 100 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 18 µg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i> - Fry	96 hours
Chronic EC10 58 µg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Juvenile (Fledgling, Hatchling,	21 days	

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SECTION 12: Ecological information

10X T4 RNA Ligase Buffer (R*,R*) -1,4-Dimercaptobutane- 2,3-diol T4 RNA Ligase 2-Mercaptoethanol	Chronic NOEC 20 µg/l Marine water	Weanling) Algae - <i>Chlorella sp.</i> - Exponential growth phase	72 hours
	Chronic NOEC 1000 µg/l Fresh water	Crustaceans - <i>Procambarus clarkii</i> - Intermolt	21 days
	Chronic NOEC 31.5 µg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i> - Juvenile (Fledgling, Hatchling, Weanling)	30 days
	Acute LC50 27000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute EC50 0.4 mg/l Fresh water	Daphnia	48 hours

12.2 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	-	-
T4 RNA Ligase 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Nuclease- Free Water water	-	-	Readily
DMSO Dimethyl sulfoxide	-	-	Not readily
T4 RNA Ligase 2-Mercaptoethanol	-	-	Not readily

12.3 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 zinc chloride	-	60960	High
T4 RNA Ligase 2-Mercaptoethanol	-0.056	-	Low

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SECTION 12: Ecological information

12.4 Mobility in soil

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

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
Nuclease- Free Water Nuclease- Free Water	Not applicable (Inorganic)	N/A	N/A	N/A	Not applicable (Inorganic)	N/A	N/A
DMSO Dimethyl sulfoxide	No	N/A	No	No	No	N/A	No

12.6 Endocrine disrupting properties

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : 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.

Hazardous waste : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 2008/98/EC.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : 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

	ADR/RID	IMDG	IATA
14.1 UN number or ID number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-

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SECTION 14: Transport information

14.5 Environmental hazards	No.	No.	No.
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Additional information

14.6 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.

14.7 Transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Product / Ingredient name	Identifiers	Designation [Usage]
Calf Intestinal Phosphatase Calf Intestinal Phosphatase	-	3

Label : 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 EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

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SECTION 15: Regulatory information

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

- Australia** : Not determined.
- Canada** : Not determined.
- China** : Not determined.
- Eurasian Economic Union** : **Russian Federation inventory:** Not determined.
- Japan** : **Japan inventory (CSCL):** Not determined.
Japan inventory (ISHL): Not determined.
- New Zealand** : Not determined.
- Philippines** : Not determined.
- Republic of Korea** : Not determined.
- Taiwan** : All components are listed or exempted.
- Thailand** : Not determined.
- Turkey** : Not determined.
- United States** : All components are active or exempted.
- Viet Nam** : Not determined.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

- Abbreviations and acronyms** :
- ATE = Acute Toxicity Estimate
 - CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 - DNEL = Derived No Effect Level
 - EUH statement = CLP-specific Hazard statement
 - PNEC = Predicted No Effect Concentration
 - RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Calf Intestinal Phosphatase Aquatic Chronic 3, H412	Calculation method

Full text of abbreviated H statements

<p>Calf Intestinal Phosphatase H302 H314 H335 H400 H410 H412</p> <p>10X T4 RNA Ligase Buffer H302 H315 H319 H335</p>	<p>Harmful if swallowed. Causes severe skin burns and eye damage. May cause respiratory irritation. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.</p> <p>Harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation.</p>
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SECTION 16: Other information

H412	Harmful to aquatic life with long lasting effects.
T4 RNA Ligase	
H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H361f	Suspected of damaging fertility.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

[Full text of classifications \[CLP/GHS\]](#)

<p>Calf Intestinal Phosphatase Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1 Aquatic Chronic 3 Skin Corr. 1B STOT SE 3</p>	<p>ACUTE TOXICITY - Category 4 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 SKIN CORROSION/IRRITATION - Category 1B SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3</p>
<p>10X T4 RNA Ligase Buffer Acute Tox. 4 Aquatic Chronic 3 Eye Irrit. 2 Skin Irrit. 2 STOT SE 3</p>	<p>ACUTE TOXICITY - Category 4 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 SKIN CORROSION/IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3</p>
<p>T4 RNA Ligase Acute Tox. 2 Acute Tox. 3 Aquatic Acute 1 Aquatic Chronic 2 Eye Dam. 1 Repr. 2 Skin Irrit. 2 Skin Sens. 1A STOT RE 2</p>	<p>ACUTE TOXICITY - Category 2 ACUTE TOXICITY - Category 3 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 REPRODUCTIVE TOXICITY - Category 2 SKIN CORROSION/IRRITATION - Category 2 SKIN SENSITISATION - Category 1A SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2</p>

Date of issue/ Date of revision : 24/09/2024

Date of previous issue : No previous validation

Version : 1

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