

# SAFETY DATA SHEET



miRNA Labeling Kit, Part Number 5190-0431

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

### 1.1 Product identifier

<b>Product name</b>	:	miRNA Labeling Kit, Part Number 5190-0431
<b>Part No. (Kit)</b>	:	5190-0431
<b>Part No.</b>	:	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

### 1.3 Details of the supplier of the safety data sheet

Agilent Technologies Manufacturing GmbH & Co. KG  
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®: +(44)-870-8200418

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

<b>Product definition</b>	:	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]

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## SECTION 2: Hazards identification

### Calf Intestinal Phosphatase

H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

<b>Ingredients of unknown toxicity</b>	: 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%
<b>Ingredients of unknown ecotoxicity</b>	: 10X Calf Intestinal Phosphatase Buffer	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 7.9%
	10X T4 RNA Ligase Buffer	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 7.9%

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

<b>Signal word</b>	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	No signal word. No signal word. No signal word. No signal word. No signal word. No signal word.
<b>Hazard statements</b>	: 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. H412 - Harmful to aquatic life with long lasting effects. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Precautionary statements</b>		
<b>Prevention</b>	: 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.

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## SECTION 2: Hazards identification

<b>Response</b>	: 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. Not applicable.
<b>Storage</b>	: 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.
<b>Disposal</b>	: 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.
<b>Hazardous ingredients</b>	: 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer	Not applicable. Not applicable. Not applicable.
<b>Supplemental label elements</b>	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Not applicable. Not applicable. Safety data sheet available on request. Not applicable. Safety data sheet available on request. Not applicable.
<b>Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles</b>	: 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.
<b>Special packaging requirements</b>		
<b>Tactile warning of danger</b>	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.

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## SECTION 2: Hazards identification

T4 RNA Ligase Not applicable.

### 2.3 Other hazards

**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	%	Regulation (EC) No. 1272/2008 [CLP]	Type
<b>Nuclease Free Water</b> Water	REACH #: Annex IV EC: 231-791-2 CAS: 7732-18-5	100. 000000000	Not classified.	[A]
<b>DMSO</b> Dimethyl sulfoxide	EC: 200-664-3 CAS: 67-68-5	100. 000000000	Not classified.	[A]
<b>10X Calf Intestinal Phosphatase Buffer</b> 2-Amino-2-(hydroxymethyl) propane-1,3-diol hydrochloride	EC: 214-684-5 CAS: 1185-53-1	<10	Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
<b>Calf Intestinal Phosphatase</b> 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 (M=10) Aquatic Chronic 1, H410 (M=1)	[1] [2]
<b>10X T4 RNA Ligase Buffer</b> 2-Amino-2-(hydroxymethyl) propane-1,3-diol hydrochloride	EC: 214-684-5 CAS: 1185-53-1	≤8.3	Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
(R*,R*)-1,4-Dimercaptobutane-2, 3-diol	EC: 222-468-7 CAS: 3483-12-3	≤1.6	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 3, H412	[1]
<b>T4 RNA Ligase</b>				

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### SECTION 3: Composition/information on ingredients

Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[2]
			<b>See Section 16 for the full text of the H statements declared above.</b>	

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.

#### Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern
- [6] Additional disclosure due to company policy
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

<b>Eye contact</b>	<b>:</b> 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. 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.
<b>Inhalation</b>	<b>:</b> 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. 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

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		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.
<b>Skin contact</b>	: 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. 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.
<b>Ingestion</b>	: 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 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.
	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

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		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 attention if symptoms occur.
	T4 RNA Ligase	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.
<b>Protection of first-aiders</b>	: 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. 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.

### 4.2 Most important symptoms and effects, both acute and delayed

#### Potential acute health effects

<b>Eye contact</b>	: 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.
<b>Inhalation</b>	: 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.
<b>Skin contact</b>	: 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.

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<b>Ingestion</b>	: 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

<b>Eye contact</b>	: 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.

<b>Inhalation</b>	: 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.

<b>Skin contact</b>	: 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.

<b>Ingestion</b>	: 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

<b>Notes to physician</b>	: 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



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	T4 RNA Ligase	to be kept under medical surveillance for 48 hours. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	: 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.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

<b>Suitable extinguishing media</b>	: Nuclease Free Water	Use an extinguishing agent suitable for the surrounding fire.
	DMSO	Use an extinguishing agent suitable for the surrounding fire.
	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.
<b>Unsuitable extinguishing media</b>	: 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.

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

<b>Hazards from the substance or mixture</b>	: Nuclease Free Water	In a fire or if heated, a pressure increase will occur and the container may burst.
	DMSO	In a fire or if heated, a pressure increase will occur and the container may burst.
	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 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.
<b>Hazardous combustion products</b>	: 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

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	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 basic level of protection for chemical incidents.
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. 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.

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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

<b>For non-emergency personnel</b>	: 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. 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.
	<b>For emergency responders</b>	: 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-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

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		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".
<b>6.2 Environmental precautions</b>	: 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

<b>Methods for cleaning up</b>	: 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 Buffer	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively,

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## SECTION 6: Accidental release measures

T4 RNA Ligase

or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

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

**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

<b>Protective measures</b>	: 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).
<b>Advice on general occupational hygiene</b>	: 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,

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## SECTION 7: Handling and storage

T4 RNA Ligase

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

### 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

Storage temperature: -20°C (-4°F). 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.

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## SECTION 7: Handling and storage

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.

### Seveso Directive - Reporting thresholds (in tonnes)

#### 7.3 Specific end use(s)

<b>Recommendations</b>	:	Nuclease Free Water	Industrial applications, Professional applications.	
		DMSO	Industrial applications, Professional applications.	
		10X Calf Intestinal Phosphatase Buffer	Industrial applications, Professional applications.	
		Calf Intestinal Phosphatase	Industrial applications, Professional applications.	
		10X T4 RNA Ligase Buffer	Industrial applications, Professional applications.	
		T4 RNA Ligase	Industrial applications, Professional applications.	
	<b>Industrial sector specific solutions</b>	:	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 8: Exposure controls/personal protection

#### 8.1 Control parameters

##### Occupational exposure limits

Product/ingredient name	Exposure limit values
<b>Calf Intestinal Phosphatase</b> Glycerol	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Mist
Zinc chloride	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> STEL: 2 mg/m <sup>3</sup> 15 minutes. Form: Fume TWA: 1 mg/m <sup>3</sup> 8 hours. Form: Fume
<b>T4 RNA Ligase</b> Glycerol	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Mist

**Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. 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

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## SECTION 8: Exposure controls/personal protection

methods for the determination of hazardous substances will also be required.

### DNELs/DMELs

No DNELs/DMELs available.

### 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.

**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

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: 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.



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## SECTION 9: Physical and chemical properties

<b>Colour</b>	:	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.		
		<b>Odour</b>	:	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.				
<b>Odour threshold</b>	:			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.		
		<b>pH</b>	:	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				
<b>Melting point/freezing point</b>	:			Nuclease Free Water	0°C
				DMSO	18.5°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.		
		<b>Initial boiling point and boiling range</b>	:	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.				

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## SECTION 9: Physical and chemical properties

<b>Flash point</b>	: Nuclease Free Water	Not available.
	DMSO	Closed cup: 87°C 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.
<b>Evaporation rate</b>	: 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.
<b>Flammability (solid, gas)</b>	: 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.
<b>Upper/lower flammability or explosive limits</b>	: 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.
<b>Vapour pressure</b>	: Nuclease Free Water	Not available.
	DMSO	0.056 kPa [room temperature]
	10X Calf Intestinal Phosphatase Buffer	Not available.
	Calf Intestinal Phosphatase	Not available.
	10X T4 RNA Ligase Buffer	Not available.
	T4 RNA Ligase	Not available.
<b>Vapour density</b>	: 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.

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## SECTION 9: Physical and chemical properties

<b>Relative density</b>	: 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.
	<b>Solubility(ies)</b>	: Nuclease Free 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	Easily soluble in the following materials: cold water and hot water.
	T4 RNA Ligase	Soluble in the following materials: cold water and hot water.
<b>Partition coefficient: n-octanol/water</b>	: 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	Not available.
	T4 RNA Ligase	Not available.
	<b>Auto-ignition temperature</b>	: Nuclease Free Water
	DMSO	300 to 302°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.
<b>Decomposition temperature</b>	: 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.
	<b>Viscosity</b>	: Nuclease Free Water
	DMSO	Dynamic (room temperature): 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.

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## SECTION 9: Physical and chemical properties

<b>Explosive properties</b>	:	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.	
	<b>Oxidising properties</b>	:	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.	

### 9.2 Other information

No additional information.

## SECTION 10: Stability and reactivity

<b>10.1 Reactivity</b>	:	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.	
	<b>10.2 Chemical stability</b>	:	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.	
<b>10.3 Possibility of hazardous reactions</b>	:	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.	

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## SECTION 10: Stability and reactivity

<b>10.4 Conditions to avoid</b>	: 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.
<b>10.5 Incompatible materials</b>	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials.
<b>10.6 Hazardous decomposition products</b>	: Nuclease Free Water DMSO 10X Calf Intestinal Phosphatase Buffer Calf Intestinal Phosphatase 10X T4 RNA Ligase Buffer T4 RNA Ligase	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>DMSO</b> Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
<b>Calf Intestinal Phosphatase</b> Zinc chloride	LD50 Oral	Rat	350 mg/kg	-

#### Acute toxicity estimates

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

#### Irritation/Corrosion

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## SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>DMSO</b> Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
<b>Calf Intestinal Phosphatase</b> Zinc chloride	Skin - Severe irritant	Rabbit	-	120 hours 1 Percent	-

### Sensitiser

**Conclusion/Summary** : Not available.

### Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
<b>10X Calf Intestinal Phosphatase Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Category 3	Not applicable.	Respiratory tract irritation
<b>Calf Intestinal Phosphatase</b> Zinc chloride	Category 3	Not applicable.	Respiratory tract irritation
<b>10X T4 RNA Ligase Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Category 3	Not applicable.	Respiratory tract irritation
(R*,R*)-1,4-Dimercaptobutane-2,3-diol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

### Information on likely routes of exposure

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	Routes of entry anticipated: Oral, Dermal, Inhalation.
T4 RNA Ligase	Routes of entry anticipated: Oral, Dermal, Inhalation.

### Potential acute health effects

<b>Inhalation</b>	: 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.

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<b>Ingestion</b>	:	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.
<b>Skin contact</b>	:	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.
<b>Eye contact</b>	:	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

<b>Inhalation</b>	:	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.
<b>Ingestion</b>	:	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.
<b>Skin contact</b>	:	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.

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## SECTION 11: Toxicological information

<b>Eye contact</b>	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

<b>General</b>	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.
<b>Carcinogenicity</b>	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.
<b>Mutagenicity</b>	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.
<b>Teratogenicity</b>	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.



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## SECTION 11: Toxicological information

<b>Developmental effects</b>	:	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.	
	<b>Fertility effects</b>	:	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.
			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 12: Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>DMSO</b> Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 100 µl/L Marine water	Algae - Ulva lactuca	72 hours
<b>Calf Intestinal Phosphatase</b> Zinc chloride	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 irritata - 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
Chronic NOEC 31.5 µg/l Fresh water	Fish - Oncorhynchus mykiss	30 days	
<b>10X T4 RNA Ligase Buffer</b> (R*,R*)-1, 4-Dimercaptobutane-2,3-diol	Acute LC50 27000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours

### 12.2 Persistence and degradability

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

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## SECTION 12: Ecological information

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

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Nuclease Free Water Water	-1.38	-	low
DMSO Dimethyl sulfoxide	-1.35	3.16	low
Calf Intestinal Phosphatase Zinc chloride	-	60960	high

### 12.4 Mobility in soil

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

Mobility : Not available.

### 12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 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.

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## SECTION 14: Transport information

ADR/RID / IMDG / IATA : Not regulated.

**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 Annex II of Marpol and the IBC Code** : Not available.

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### 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.

<b>Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles</b>	<b>:</b> 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.

#### 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 (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

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## SECTION 15: Regulatory information

<b>Australia</b>	: Not determined.
<b>Canada</b>	: Not determined.
<b>China</b>	: Not determined.
<b>Europe</b>	: All components are listed or exempted.
<b>Japan</b>	: <b>Japan inventory (ENCS)</b> : Not determined. <b>Japan inventory (ISHL)</b> : Not determined.
<b>Malaysia</b>	: Not determined.
<b>New Zealand</b>	: Not determined.
<b>Philippines</b>	: Not determined.
<b>Republic of Korea</b>	: Not determined.
<b>Taiwan</b>	: All components are listed or exempted.
<b>Thailand</b>	: Not determined.
<b>Turkey</b>	: Not determined.
<b>United States</b>	: All components are listed or exempted.
<b>Viet Nam</b>	: 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
<b>Calf Intestinal Phosphatase</b> Aquatic Chronic 3, H412	Calculation method

### Full text of abbreviated H statements

<b>10X Calf Intestinal Phosphatase Buffer</b> H315 H319 H335  <b>Calf Intestinal Phosphatase</b> H302 H314 H335 H400 H410 H412  <b>10X T4 RNA Ligase Buffer</b> H302 H315 H319 H335 H412	Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation.  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.  Harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. Harmful to aquatic life with long lasting effects.
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### Full text of classifications [CLP/GHS]

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## SECTION 16: Other information

### 10X Calf Intestinal Phosphatase Buffer

Eye Irrit. 2, H319  
Skin Irrit. 2, H315  
STOT SE 3, H335

SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2  
SKIN CORROSION/IRRITATION - Category 2  
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE  
(Respiratory tract irritation) - Category 3

### Calf Intestinal Phosphatase

Acute Tox. 4, H302  
Aquatic Acute 1, H400  
Aquatic Chronic 1, H410  
Aquatic Chronic 3, H412  
Skin Corr. 1B, H314  
STOT SE 3, H335

ACUTE TOXICITY (oral) - 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  
(Respiratory tract irritation) - Category 3

### 10X T4 RNA Ligase Buffer

Acute Tox. 4, H302  
Aquatic Chronic 3, H412  
Eye Irrit. 2, H319  
Skin Irrit. 2, H315  
STOT SE 3, H335

ACUTE TOXICITY (oral) - 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  
(Respiratory tract irritation) - Category 3

**Date of issue/ Date of revision** : 23/06/2017

**Date of previous issue** : No previous validation.

**Version** : 1

#### Notice to reader

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