

SAFETY DATA SHEET



T4 DNA Ligase, Part Number 600011

Section 1. Identification

Product identifier : T4 DNA Ligase, Part Number 600011
Part No. (Chemical Kit) : 600011
Part No. : 10 mM rATP (pH 7.5) in Sterile Water 200340-81
 T4 DNA Ligase 600011-51
 10x Ligase Buffer 600011-52

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

Analytical reagent.

10 mM rATP (pH 7.5) in Sterile Water	250 µl
T4 DNA Ligase	0.75 µl (300 U 4 U/µl)
10x Ligase Buffer	1 ml

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

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

Section 2. Hazard(s) identification

Classification of the substance or mixture

Not classified.

10x DNA Ligase	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%
10x 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: 1 - 10%
	Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 1 - 10%
10x Ligase Buffer	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 7.9%

GHS label elements

Signal word	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No signal word. No signal word. No signal word.
Hazard statements	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Precautionary statements		
Prevention	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not applicable. Not applicable. Not applicable.

Section 2. Hazard(s) identification

Response	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
Storage	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
Disposal	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
Supplemental label elements	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
Other hazards which do not result in classification	: 10 mM rATP (pH 7.5) in Sterile Water	None known.
	T4 DNA Ligase	None known.
	10x Ligase Buffer	None known.

Section 3. Composition and ingredient information

Substance/mixture	: 10 mM rATP (pH 7.5) in Sterile Water	Mixture
	T4 DNA Ligase	Mixture
	10x Ligase Buffer	Mixture

CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
T4 DNA Ligase		
Glycerol	≥30 - ≤60	56-81-5

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

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

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	: 10 mM rATP (pH 7.5) in Sterile 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.
	T4 DNA 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.
	10x 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.

Section 4. First aid measures

Inhalation	: 10 mM rATP (pH 7.5) in Sterile Water	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	T4 DNA Ligase	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	10x 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.
Skin contact	: 10 mM rATP (pH 7.5) in Sterile Water	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	T4 DNA Ligase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	10x Ligase Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	: 10 mM rATP (pH 7.5) in Sterile 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.
	T4 DNA 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.
	10x 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.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Inhalation	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Skin contact	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Ingestion	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.

Section 4. First aid measures

Over-exposure signs/symptoms

Eye contact	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.
Inhalation	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.
Skin contact	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.
Ingestion	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.

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

Notes to physician	: 10 mM rATP (pH 7.5) in Sterile Water	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	T4 DNA Ligase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	10x Ligase Buffer	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	: 10 mM rATP (pH 7.5) in Sterile Water	No specific treatment.
	T4 DNA Ligase	No specific treatment.
	10x Ligase Buffer	No specific treatment.
Protection of first-aiders	: 10 mM rATP (pH 7.5) in Sterile Water	No action shall be taken involving any personal risk or without suitable training.
	T4 DNA Ligase	No action shall be taken involving any personal risk or without suitable training.
	10x Ligase Buffer	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media	: 10 mM rATP (pH 7.5) in Sterile Water	Use an extinguishing agent suitable for the surrounding fire.
	T4 DNA Ligase	Use an extinguishing agent suitable for the surrounding fire.
	10x Ligase Buffer	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: 10 mM rATP (pH 7.5) in Sterile Water	None known.
	T4 DNA Ligase	None known.
	10x Ligase Buffer	None known.

Section 5. Firefighting measures

Specific hazards arising from the chemical	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase	In a fire or if heated, a pressure increase will occur and the container may burst.
	10x Ligase Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
		In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase	No specific data.
	10x Ligase Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide
		Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds metal oxide/oxides
Special protective actions for fire-fighters	: 10 mM rATP (pH 7.5) in Sterile 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.
	T4 DNA 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.
	10x 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.
Special protective equipment for fire-fighters	: 10 mM rATP (pH 7.5) in Sterile Water	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	T4 DNA Ligase	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	10x 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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: 10 mM rATP (pH 7.5) in Sterile 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.
	T4 DNA 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.
	10x Ligase Buffer	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding

Section 6. Accidental release measures

For emergency responders : 10 mM rATP (pH 7.5) in Sterile Water

T4 DNA Ligase

10x Ligase Buffer

areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

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".

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Environmental precautions : 10 mM rATP (pH 7.5) in Sterile Water

T4 DNA Ligase

10x 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).

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Methods and material for containment and cleaning up

Methods for cleaning up : 10 mM rATP (pH 7.5) in Sterile Water

T4 DNA Ligase

10x Ligase 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.

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Section 7. Handling and storage

Precautions for safe handling

Protective measures : 10 mM rATP (pH 7.5) in Sterile Water

T4 DNA Ligase

10x Ligase Buffer

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

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

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Section 7. Handling and storage

<p>Advice on general occupational hygiene</p>	<p>: 10 mM rATP (pH 7.5) in Sterile Water</p>	<p>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.</p>
	<p>T4 DNA Ligase</p>	<p>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.</p>
	<p>10x Ligase Buffer</p>	<p>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.</p>
<p>Conditions for safe storage, including any incompatibilities</p>	<p>: 10 mM rATP (pH 7.5) in Sterile Water</p>	<p>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.</p>
	<p>T4 DNA Ligase</p>	<p>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.</p>
	<p>10x Ligase Buffer</p>	<p>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.</p>

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
T4 DNA Ligase Glycerol	Safe Work Australia (Australia, 1/2014). TWA: 10 mg/m ³ 8 hours.

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

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

- Physical state** : 10 mM rATP (pH 7.5) in Sterile Water Liquid.
T4 DNA Ligase Liquid.
10x Ligase Buffer Liquid.
- Colour** : 10 mM rATP (pH 7.5) in Sterile Water Not available.
T4 DNA Ligase Not available.
10x Ligase Buffer Not available.
- Odour** : 10 mM rATP (pH 7.5) in Sterile Water Not available.
T4 DNA Ligase Not available.
10x Ligase Buffer Not available.

Section 9. Physical and chemical properties

Odour threshold	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
pH	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	7 7.5 7.5
Melting point	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	0°C (32°F) Not available. Not available.
Boiling point	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	100°C (212°F) Not available. Not available.
Flash point	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Evaporation rate	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Flammability (solid, gas)	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not applicable. Not applicable. Not applicable.
Lower and upper explosive (flammable) limits	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Vapour pressure	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Vapour density	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Relative density	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Solubility	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Easily soluble in the following materials: cold water and hot water. Soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.
Auto-ignition temperature	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.

Section 9. Physical and chemical properties

Decomposition temperature	: 10 mM rATP (pH 7.5) in Sterile Water	Not available.
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.
Viscosity	: 10 mM rATP (pH 7.5) in Sterile Water	Not available.
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.

Section 10. Stability and reactivity

Reactivity	: 10 mM rATP (pH 7.5) in Sterile Water	No specific test data related to reactivity available for this product or its ingredients.
	T4 DNA Ligase	No specific test data related to reactivity available for this product or its ingredients.
	10x Ligase Buffer	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: 10 mM rATP (pH 7.5) in Sterile Water	The product is stable.
	T4 DNA Ligase	The product is stable.
	10x Ligase Buffer	The product is stable.
Possibility of hazardous reactions	: 10 mM rATP (pH 7.5) in Sterile Water	Under normal conditions of storage and use, hazardous reactions will not occur.
	T4 DNA Ligase	Under normal conditions of storage and use, hazardous reactions will not occur.
	10x Ligase Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.
Incompatible materials	: 10 mM rATP (pH 7.5) in Sterile Water	May react or be incompatible with oxidising materials.
	T4 DNA Ligase	May react or be incompatible with oxidising materials.
	10x Ligase Buffer	May react or be incompatible with oxidising materials.
Hazardous decomposition products	: 10 mM rATP (pH 7.5) in Sterile Water	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	T4 DNA Ligase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	10x Ligase Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
T4 DNA Ligase Glycerol	LD50 Oral	Rat	12600 mg/kg	-

Irritation/Corrosion

Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
T4 DNA Ligase Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-

Sensitisation

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure : 10 mM rATP (pH 7.5) in Sterile Water
T4 DNA Ligase
10x Ligase Buffer

Not available.
Routes of entry anticipated: Oral, Dermal, Inhalation.
Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : 10 mM rATP (pH 7.5) in Sterile Water
T4 DNA Ligase
10x Ligase Buffer

No known significant effects or critical hazards.
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Inhalation : 10 mM rATP (pH 7.5) in Sterile Water
T4 DNA Ligase
10x Ligase Buffer

No known significant effects or critical hazards.
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Skin contact : 10 mM rATP (pH 7.5) in Sterile Water
T4 DNA Ligase
10x Ligase Buffer

No known significant effects or critical hazards.
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Ingestion : 10 mM rATP (pH 7.5) in Sterile Water
T4 DNA Ligase
10x Ligase Buffer

No known significant effects or critical hazards.
No known significant effects or critical hazards.
No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : 10 mM rATP (pH 7.5) in Sterile Water
T4 DNA Ligase
10x Ligase Buffer

No specific data.
No specific data.
No specific data.

Section 11. Toxicological information

Inhalation	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.
Skin contact	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.
Ingestion	: 10 mM rATP (pH 7.5) in Sterile Water	No specific data.
	T4 DNA Ligase	No specific data.
	10x Ligase Buffer	No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Carcinogenicity	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Mutagenicity	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Teratogenicity	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Developmental effects	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.
Fertility effects	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	No known significant effects or critical hazards.
	10x Ligase Buffer	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
T4 DNA Ligase Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
T4 DNA Ligase Glycerol	-1.76	-	low

Mobility in soil

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

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

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

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

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

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

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

5

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Section 15. Regulatory information

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

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

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

Section 16. Any other relevant information

History

Date of issue/Date of revision	: 25/05/2017
Date of previous issue	: 30/03/2016.
Version	: 4

Key to abbreviations

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

Procedure used to derive the classification

Classification	Justification
Not classified.	

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Any other relevant information

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