

# SAFETY DATA SHEET



T4 DNA Ligase, Part Number 600011

## Section 1. Identification

### 1.1 Product identifier

**Product name** : 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  
**Validation date** : 3/27/2022

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

**Material uses** : Analytical reagent.  
 10 mM rATP (pH 7.5) in Sterile Water 0.25 ml  
 T4 DNA Ligase 0.075 ml (300 U 4 U/µl)  
 10x Ligase Buffer 1 ml

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

**Supplier/Manufacturer** : Agilent Technologies, Inc.  
 5301 Stevens Creek Blvd  
 Santa Clara, CA 95051, USA  
 800-227-9770

### 1.4 Emergency telephone number

**In case of emergency** : CHEMTREC®: 1-800-424-9300

## Section 2. Hazards identification

### 2.1 Classification of the substance or mixture

<b>OSHA/HCS status</b>	: 10 mM rATP (pH 7.5) in Sterile Water  T4 DNA Ligase  10x Ligase Buffer	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.  This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
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### Classification of the substance or mixture

<b>T4 DNA Ligase</b> H320	EYE IRRITATION - Category 2B  10x Ligase Buffer	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 1.4%
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### 2.2 GHS label elements

**Signal word** :

## Section 2. Hazards identification

	10 mM rATP (pH 7.5) in Sterile Water	No signal word.
	T4 DNA Ligase	Warning
	10x Ligase Buffer	No signal word.
<b>Hazard statements</b>	: 10 mM rATP (pH 7.5) in Sterile Water	No known significant effects or critical hazards.
	T4 DNA Ligase	H320 - Causes eye irritation.
	10x Ligase Buffer	No known significant effects or critical hazards.
<b>Precautionary statements</b>		
<b>Prevention</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
<b>Response</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P337 + P313 - If eye irritation persists: Get medical advice or attention.
	10x Ligase Buffer	Not applicable.
<b>Storage</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
<b>Disposal</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not applicable.
	T4 DNA Ligase	Not applicable.
	10x Ligase Buffer	Not applicable.
<b>Supplemental label elements</b>	: 10 mM rATP (pH 7.5) in Sterile Water	None known.
	T4 DNA Ligase	None known.
	10x Ligase Buffer	None known.
<b>2.3 Other hazards</b>		
<b>Hazards not otherwise classified</b>	: 10 mM rATP (pH 7.5) in Sterile Water	None known.
	T4 DNA Ligase	None known.
	10x Ligase Buffer	None known.

## Section 3. Composition/information on ingredients

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

Ingredient name	%	CAS number
T4 DNA Ligase		
Glycerol	≥50 - ≤75	56-81-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.**

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

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

<b>Eye contact</b>	: 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. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	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.
<b>Inhalation</b>	: 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. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	10x 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.
<b>Skin contact</b>	: 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. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	10x Ligase Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
<b>Ingestion</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	T4 DNA Ligase	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical

## Section 4. First aid measures

10x Ligase Buffer

personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

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

#### Potential acute health effects

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

#### Over-exposure signs/symptoms

<b>Eye contact</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase  10x Ligase Buffer	No specific data.  Adverse symptoms may include the following: irritation watering redness No specific data.
<b>Inhalation</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data. No specific data. No specific data.
<b>Skin contact</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data. No specific data. No specific data.
<b>Ingestion</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data. No specific data. No specific data.

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

## Section 4. First aid measures

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

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### 5.1 Extinguishing media

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

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

<b>Specific hazards arising from the chemical</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase  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. In a fire or if heated, a pressure increase will occur and the container may burst.
<b>Hazardous thermal decomposition products</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase  10x Ligase Buffer	No specific data.  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

## Section 5. Fire-fighting measures

metal oxide/oxides

### 5.3 Advice for firefighters

#### 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

### 6.1 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 spilled 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

10x 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 spilled material. Put on appropriate personal protective equipment.

## Section 6. Accidental release measures

<b>For emergency responders</b>	: 10 mM rATP (pH 7.5) in Sterile Water	If specialized 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". If specialized 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". If specialized 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 DNA Ligase	
	10x Ligase Buffer	
<b>6.2 Environmental precautions</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Avoid dispersal of spilled 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). Avoid dispersal of spilled 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). Avoid dispersal of spilled 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 DNA Ligase	
	10x Ligase Buffer	

### 6.3 Methods and materials for containment and cleaning up

<b>Methods for cleaning up</b>	: 10 mM rATP (pH 7.5) in Sterile 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. 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. Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	T4 DNA Ligase	
	10x Ligase Buffer	

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

## Section 7. Handling and storage

<p><b>Protective measures</b></p>	<p>: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase</p> <p>10x Ligase Buffer</p>	<p>Put on appropriate personal protective equipment (see Section 8). Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. Put on appropriate personal protective equipment (see Section 8).</p>
<p><b>Advice on general occupational hygiene</b></p>	<p>: 10 mM rATP (pH 7.5) in Sterile Water</p> <p>T4 DNA Ligase</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. 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. 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><b>7.2 Conditions for safe storage, including any incompatibilities</b></p>	<p>: 10 mM rATP (pH 7.5) in Sterile Water</p> <p>T4 DNA Ligase</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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from</p>



## Section 7. Handling and storage

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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

### 7.3 Specific end use(s)

<b>Recommendations</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications.
<b>Industrial sector specific solutions</b>	: <input checked="" type="checkbox"/> 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<input checked="" type="checkbox"/> T4 DNA Ligase Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust

### 8.2 Exposure controls

<b>Appropriate engineering controls</b>	: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
<b>Environmental exposure controls</b>	: 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

<b>Hygiene measures</b>	: 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.
<b>Eye/face protection</b>	: <input checked="" type="checkbox"/> 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: chemical splash goggles.

### Skin protection

## Section 8. Exposure controls/personal protection

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

## Section 9. Physical and chemical properties and safety characteristics

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

### Appearance

<b>Physical state</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Liquid.
	T4 DNA Ligase	Liquid.
	10x Ligase Buffer	Liquid.
<b>Color</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not available.
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.
<b>Odor</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not available.
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.
<b>Odor threshold</b>	: 10 mM rATP (pH 7.5) in Sterile Water	Not available.
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.
<b>pH</b>	: 10 mM rATP (pH 7.5) in Sterile Water	7
	T4 DNA Ligase	7.5
	10x Ligase Buffer	7.5
<b>Melting point/freezing point</b>	: 10 mM rATP (pH 7.5) in Sterile Water	0°C (32°F)
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.
<b>Boiling point, initial boiling point, and boiling range</b>	: 10 mM rATP (pH 7.5) in Sterile Water	100°C (212°F)
	T4 DNA Ligase	Not available.
	10x Ligase Buffer	Not available.
<b>Flash point</b>	:	

## Section 9. Physical and chemical properties and safety characteristics

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
<b>T4 DNA Ligase</b> (R*,R*) -1,4-Dimercaptobutane- 2,3-diol	>110	>230				
Glycerol			Pensky-Martens	177	350.6	
<b>10x Ligase Buffer</b> (R*,R*) -1,4-Dimercaptobutane- 2,3-diol	>110	>230				

**Evaporation rate** : 10 mM rATP (pH 7.5) in Sterile Water Not available.  
T4 DNA Ligase Not available.  
10x Ligase Buffer Not available.

**Flammability** : 10 mM rATP (pH 7.5) in Sterile Water Not applicable.  
T4 DNA Ligase Not applicable.  
10x Ligase Buffer Not applicable.

**Lower and upper explosion limit/flammability limit** : 10 mM rATP (pH 7.5) in Sterile Water Not available.  
T4 DNA Ligase Not available.  
10x Ligase Buffer Not available.

**Vapor pressure** :

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
<b>10 mM rATP (pH 7.5) in Sterile Water</b>						
Water	23.8	3.2		92.258	12.3	
Trometamol	<0.00075006	<0.0001				
<b>T4 DNA Ligase</b>						
Water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
<b>10x Ligase Buffer</b>						
Water	23.8	3.2		92.258	12.3	
2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	0.000027	0.0000036		0.00007501	0.000001	

**Relative vapor density** : 10 mM rATP (pH 7.5) in Sterile Water Not available.  
T4 DNA Ligase Not available.  
10x Ligase Buffer Not available.

**Relative density** : 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 and safety characteristics

<b>Solubility</b>	: 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.												
<b>Partition coefficient: n-octanol/water</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not applicable. Not applicable. Not applicable.												
<b>Auto-ignition temperature</b>	: <table border="1" style="display: inline-table; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Ingredient name</th> <th style="text-align: center;">°C</th> <th style="text-align: center;">°F</th> <th style="text-align: left;">Method</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">T4 DNA Ligase</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">Glycerol</td> <td style="text-align: center;">370</td> <td style="text-align: center;">698</td> <td></td> </tr> </tbody> </table>	Ingredient name	°C	°F	Method	T4 DNA Ligase				Glycerol	370	698		
Ingredient name	°C	°F	Method											
T4 DNA Ligase														
Glycerol	370	698												
<b>Decomposition temperature</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.												
<b>Viscosity</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available. Not available. Not available.												
<b>Particle characteristics</b>														
<b>Median particle size</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not applicable. Not applicable. Not applicable.												

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	The product is stable. The product is stable. The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.
<b>10.4 Conditions to avoid</b>	: 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 10. Stability and reactivity

<b>10.5 Incompatible materials</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase  10x Ligase Buffer	May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials.
<b>10.6 Hazardous decomposition products</b>	: 10 mM rATP (pH 7.5) in Sterile Water  T4 DNA Ligase  10x Ligase Buffer	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
T4 DNA Ligase Glycerol	LD50 Oral	Rat	12600 mg/kg	-

#### Irritation/Corrosion

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

#### Sensitization

Not available.

#### Mutagenicity

**Conclusion/Summary** : Not available.

#### Carcinogenicity

**Conclusion/Summary** : Not available.

#### Reproductive toxicity

**Conclusion/Summary** : Not available.

#### Teratogenicity

**Conclusion/Summary** : Not available.

#### Specific target organ toxicity (single exposure)

Not available.

#### Specific target organ toxicity (repeated exposure)

Not available.

#### Aspiration hazard

Not available.

## Section 11. Toxicological information

<b>Information on the likely routes of exposure</b>	: 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.
<b><u>Potential acute health effects</u></b>		
<b>Eye contact</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No known significant effects or critical hazards.  Causes eye irritation. No known significant effects or critical hazards.
<b>Inhalation</b>	: 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.
<b>Skin contact</b>	: 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.
<b>Ingestion</b>	: 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

<b>Eye contact</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data.  Adverse symptoms may include the following: irritation watering redness No specific data.
<b>Inhalation</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data.  No specific data. No specific data.
<b>Skin contact</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data.  No specific data. No specific data.
<b>Ingestion</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No specific data.  No specific data. No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

<b>Potential immediate effects</b>	: Not available.
<b>Potential delayed effects</b>	: Not available.

#### Long term exposure

<b>Potential immediate effects</b>	: Not available.
<b>Potential delayed effects</b>	: Not available.

#### Potential chronic health effects

## Section 11. Toxicological information

<b>General</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No known significant effects or critical hazards.
<b>Mutagenicity</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No known significant effects or critical hazards.
<b>Reproductive toxicity</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
T4 DNA Ligase Glycerol	12600	N/A	N/A	N/A	N/A

<b>Other information</b>	: 10 mM rATP (pH 7.5) in Sterile Water T4 DNA Ligase 10x Ligase Buffer	Not available.  Not available. Adverse symptoms may include the following: May cause skin sensitization.
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## Section 12. Ecological information

### 12.1 Toxicity

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

### 12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
T4 DNA Ligase Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
T4 DNA Ligase Glycerol	-1.76	-	low

## Section 12. Ecological information

### 12.4 Mobility in soil

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

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

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

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

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## Section 14. Transport information

DOT / TDG / Mexico / IMDG / IATA : Not regulated.

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

Transport in bulk according to IMO instruments : Not available.

## Section 15. Regulatory information

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

U.S. Federal regulations : TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed



## Section 15. Regulatory information

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : 10 mM rATP (pH 7.5) in Sterile Water Not applicable.  
T4 DNA Ligase EYE IRRITATION - Category 2B  
10x Ligase Buffer Not applicable.

#### Composition/information on ingredients

Name	%	Classification
T4 DNA Ligase Glycerol	≥50 - ≤75	EYE IRRITATION - Category 2B

### State regulations

**Massachusetts** : The following components are listed: GLYCERINE MIST

**New York** : None of the components are listed.

**New Jersey** : The following components are listed: GLYCERIN; 1,2,3-PROPANETRIOL

**Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL

### California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

**Australia** : All components are listed or exempted.

**Canada** : All components are listed or exempted.

**China** : All components are listed or exempted.

**Europe** : All components are listed or exempted.

**Japan** : **Japan inventory (CSCL)**: Not determined.  
**Japan inventory (ISHL)**: Not determined.

**New Zealand** : All components are listed or exempted.

## Section 15. Regulatory information

<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>	: <input checked="" type="checkbox"/> All components are active or exempted.
<b>Viet Nam</b>	: Not determined.

## Section 16. Other information

### Procedure used to derive the classification

Classification	Justification
<input checked="" type="checkbox"/> <b>T4 DNA Ligase</b> EYE IRRITATION - Category 2B	Calculation method

### History

<b>Date of issue</b>	: 03/27/2022
<b>Date of previous issue</b>	: 08/12/2019
<b>Version</b>	: 6

### Key to abbreviations

: ATE = Acute Toxicity Estimate
: BCF = Bioconcentration Factor
: GHS = Globally Harmonized System of Classification and Labelling of Chemicals
: IATA = International Air Transport Association
: IBC = Intermediate Bulk Container
: IMDG = International Maritime Dangerous Goods
: LogPow = logarithm of the octanol/water partition coefficient
: MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
: N/A = Not available
: UN = United Nations

Indicates information that has changed from previously issued version.

### Notice to reader

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