

# SAFETY DATA SHEET



Pfu DNA Ligase, Part Number 600191

## Section 1. Identification

**Product identifier** : Pfu DNA Ligase, Part Number 600191  
**Part No. (Chemical Kit)** : 600191  
**Part No.** : Pfu DNA Ligase 600191-51  
 Pfu DNA Ligase 10X Buffer 600191-52

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

Analytical reagent.

For Research Use Only. Not for use in diagnostic procedures.

Pfu DNA Ligase 0.1 ml (400 U 4 U/μl)  
 Pfu DNA Ligase 10X Buffer 0.3 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

**Pfu DNA Ligase 10X Buffer**  
 H319

SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A

Pfu DNA Ligase	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 30 - 60%
Pfu DNA Ligase 10X 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%
Pfu DNA Ligase 10X Buffer	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 3.2%

### GHS label elements

#### Hazard pictograms

: **Pfu DNA Ligase 10X Buffer**



#### Signal word

: **Pfu DNA Ligase**  
**Pfu DNA Ligase 10X Buffer** No signal word.  
 WARNING

#### Hazard statements

: **Pfu DNA Ligase**  
**Pfu DNA Ligase 10X Buffer** No known significant effects or critical hazards.  
 H319 - Causes serious eye irritation.

### Precautionary statements

#### Prevention

: **Pfu DNA Ligase**  
**Pfu DNA Ligase 10X Buffer** Not applicable.  
 P280 - Wear eye or face protection.  
 P264 - Wash hands thoroughly after handling.

## Section 2. Hazard(s) identification

<b>Response</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	Not applicable. 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 attention.
<b>Storage</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	Not applicable. Not applicable.
<b>Disposal</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	Not applicable. Not applicable.
<b>Supplemental label elements</b>		
<b>Additional warning phrases</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	Not applicable. Not applicable.
<b>Other hazards which do not result in classification</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	None known. None known.

## Section 3. Composition and ingredient information

<b>Substance/mixture</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	Mixture Mixture
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### CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
Pfu DNA Ligase Glycerol	≥30 - ≤60	56-81-5
Pfu DNA Ligase 10X Buffer Polyoxyethylene octyl phenyl ether	≤2.3	9002-93-1

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

<b>Eye contact</b>	: Pfu DNA Ligase  Pfu DNA Ligase 10X 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. 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.
<b>Inhalation</b>	: Pfu DNA Ligase  Pfu DNA Ligase 10X Buffer	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. 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.

## Section 4. First aid measures

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

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

#### Potential acute health effects

<b>Eye contact</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. Causes serious eye irritation.
<b>Inhalation</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

<b>Eye contact</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No specific data. Adverse symptoms may include the following: pain or irritation watering redness
<b>Inhalation</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No specific data. No specific data.
<b>Skin contact</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No specific data. No specific data.
<b>Ingestion</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No specific data. No specific data.

## Section 4. First aid measures

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

<b>Notes to physician</b>	: Pfu DNA Ligase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	Pfu DNA Ligase 10X 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.
<b>Specific treatments</b>	: Pfu DNA Ligase	No specific treatment.
	Pfu DNA Ligase 10X Buffer	No specific treatment.
<b>Protection of first-aiders</b>	: Pfu DNA Ligase	No action shall be taken involving any personal risk or without suitable training.
	Pfu DNA Ligase 10X Buffer	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.

See toxicological information (Section 11)

## Section 5. Firefighting measures

### Extinguishing media

<b>Suitable extinguishing media</b>	: Pfu DNA Ligase	Use an extinguishing agent suitable for the surrounding fire.
	Pfu DNA Ligase 10X Buffer	Use an extinguishing agent suitable for the surrounding fire.
<b>Unsuitable extinguishing media</b>	: Pfu DNA Ligase	None known.
	Pfu DNA Ligase 10X Buffer	None known.
<b>Specific hazards arising from the chemical</b>	: Pfu DNA Ligase	In a fire or if heated, a pressure increase will occur and the container may burst.
	Pfu DNA Ligase 10X Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
<b>Hazardous thermal decomposition products</b>	: Pfu DNA Ligase	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	Pfu DNA Ligase 10X Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds metal oxide/oxides
<b>Special protective actions for fire-fighters</b>	: Pfu 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.
	Pfu DNA Ligase 10X 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.

## Section 5. Firefighting measures

<b>Special protective equipment for fire-fighters</b>	: Pfu 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.
	Pfu DNA Ligase 10X 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

<b>For non-emergency personnel</b>	: Pfu 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.
	Pfu DNA Ligase 10X 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. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
<b>For emergency responders</b>	: Pfu DNA 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".
	Pfu DNA Ligase 10X 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".
<b>Environmental precautions</b>	: Pfu DNA 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).
	Pfu DNA Ligase 10X 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).

### Methods and material for containment and cleaning up

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

## Section 7. Handling and storage

### Precautions for safe handling

<b>Protective measures</b>	: Pfu DNA Ligase	Put on appropriate personal protective equipment (see Section 8).
	Pfu DNA Ligase 10X Buffer	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour 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.
<b>Advice on general occupational hygiene</b>	: Pfu DNA Ligase	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	Pfu DNA Ligase 10X 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.
<b>Conditions for safe storage, including any incompatibilities</b>	: Pfu DNA 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.
	Pfu DNA Ligase 10X 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.

## Section 8. Exposure controls and personal protection

### Control parameters

#### Occupational exposure limits

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

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



## Section 8. Exposure controls and personal protection

**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

<b>Physical state</b>	: Pfu DNA Ligase	Liquid.
	: Pfu DNA Ligase 10X Buffer	Liquid.
<b>Colour</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Odour</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Odour threshold</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>pH</b>	: Pfu DNA Ligase	7.5
	: Pfu DNA Ligase 10X Buffer	7.5
<b>Melting point</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Boiling point</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Flash point</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Evaporation rate</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Flammability (solid, gas)</b>	: Pfu DNA Ligase	Not applicable.
	: Pfu DNA Ligase 10X Buffer	Not applicable.
<b>Lower and upper explosive (flammable) limits</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.
<b>Vapour pressure</b>	: Pfu DNA Ligase	Not available.
	: Pfu DNA Ligase 10X Buffer	Not available.

## Section 9. Physical and chemical properties

<b>Vapour density</b>	: Pfu DNA Ligase	Not available.
	Pfu DNA Ligase 10X Buffer	Not available.
<b>Relative density</b>	: Pfu DNA Ligase	Not available.
	Pfu DNA Ligase 10X Buffer	Not available.
<b>Solubility</b>	: Pfu DNA Ligase	Soluble in the following materials: cold water and hot water.
	Pfu DNA Ligase 10X Buffer	Easily soluble in the following materials: cold water and hot water.
<b>Partition coefficient: n-octanol/water</b>	: Pfu DNA Ligase	Not available.
	Pfu DNA Ligase 10X Buffer	Not available.
<b>Auto-ignition temperature</b>	: Pfu DNA Ligase	Not available.
	Pfu DNA Ligase 10X Buffer	Not available.
<b>Decomposition temperature</b>	: Pfu DNA Ligase	Not available.
	Pfu DNA Ligase 10X Buffer	Not available.
<b>Viscosity</b>	: Pfu DNA Ligase	Not available.
	Pfu DNA Ligase 10X Buffer	Not available.

## Section 10. Stability and reactivity

<b>Reactivity</b>	: Pfu DNA Ligase	No specific test data related to reactivity available for this product or its ingredients.
	Pfu DNA Ligase 10X Buffer	No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	: Pfu DNA Ligase	The product is stable.
	Pfu DNA Ligase 10X Buffer	The product is stable.
<b>Possibility of hazardous reactions</b>	: Pfu DNA Ligase	Under normal conditions of storage and use, hazardous reactions will not occur.
	Pfu DNA Ligase 10X Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
<b>Conditions to avoid</b>	: Pfu DNA Ligase	No specific data.
	Pfu DNA Ligase 10X Buffer	No specific data.
<b>Incompatible materials</b>	: Pfu DNA Ligase	May react or be incompatible with oxidising materials.
	Pfu DNA Ligase 10X Buffer	May react or be incompatible with oxidising materials.
<b>Hazardous decomposition products</b>	: Pfu DNA Ligase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Pfu DNA Ligase 10X 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
Pfu DNA Ligase Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Pfu DNA Ligase 10X Buffer Polyoxyethylene octyl phenyl ether	LD50 Oral	Rat	1800 mg/kg	-

#### Irritation/Corrosion



## Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
Pfu DNA Ligase Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Pfu DNA Ligase 10X Buffer Polyoxyethylene octyl phenyl ether	Eyes - Moderate irritant	Rabbit	-	24 hours 10 microliters	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 microliters	-

### 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** : Pfu DNA Ligase Routes of entry anticipated: Oral, Dermal, Inhalation.  
Pfu DNA Ligase 10X Buffer Routes of entry anticipated: Oral, Dermal, Inhalation.

### Potential acute health effects

**Eye contact** : Pfu DNA Ligase No known significant effects or critical hazards.  
Pfu DNA Ligase 10X Buffer Causes serious eye irritation.

**Inhalation** : Pfu DNA Ligase No known significant effects or critical hazards.  
Pfu DNA Ligase 10X Buffer No known significant effects or critical hazards.

**Skin contact** : Pfu DNA Ligase No known significant effects or critical hazards.  
Pfu DNA Ligase 10X Buffer No known significant effects or critical hazards.

**Ingestion** : Pfu DNA Ligase No known significant effects or critical hazards.  
Pfu DNA Ligase 10X Buffer No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : Pfu DNA Ligase No specific data.  
Pfu DNA Ligase 10X Buffer Adverse symptoms may include the following:  
pain or irritation  
watering  
redness

**Inhalation** : Pfu DNA Ligase No specific data.  
Pfu DNA Ligase 10X Buffer No specific data.

**Skin contact** : Pfu DNA Ligase No specific data.  
Pfu DNA Ligase 10X Buffer No specific data.

## Section 11. Toxicological information

**Ingestion** : Pfu DNA Ligase No specific data.  
Pfu DNA Ligase 10X 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.

<b>General</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Mutagenicity</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Teratogenicity</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Developmental effects</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Fertility effects</b>	: Pfu DNA Ligase Pfu DNA Ligase 10X Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
Pfu DNA Ligase 10X Buffer Oral	181602 mg/kg

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
Pfu DNA Ligase Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Pfu DNA Ligase 10X Buffer Polyoxyethylene octyl phenyl ether	Acute LC50 5.85 mg/l Fresh water	Crustaceans - Ceriodaphnia rigaudi - Neonate	48 hours
	Acute LC50 11.2 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 4500 µg/l Fresh water	Fish - Pimephales promelas	96 hours

### Persistence and degradability

## Section 12. Ecological information

Product/ingredient name	Test	Result	Dose	Inoculum
Pfu DNA Ligase Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability	
Pfu DNA Ligase 10X Buffer Polyoxyethylene octyl phenyl ether	-	-	Readily	

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Pfu DNA Ligase Glycerol	-1.76	-	low
Pfu DNA Ligase 10X Buffer Polyoxyethylene octyl phenyl ether	4.86	-	high

### Mobility in soil

Soil/water partition coefficient (K<sub>oc</sub>) : 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

Not regulated.

### Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

### 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

<b>Australia</b>	: Not determined.
<b>Canada</b>	: Not determined.
<b>China</b>	: All components are listed or exempted.
<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.

## Section 16. Any other relevant information

### History

**Date of issue/Date of revision** : 23/01/2018

**Date of previous issue** : 25/10/2017.

**Version** : 5

### 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

## Section 16. Any other relevant information

SUSMP = Standard Uniform Schedule of Medicine and Poisons  
UN = United Nations

### Procedure used to derive the classification

Classification	Justification
Pfu DNA Ligase 10X Buffer Eye Irrit. 2A, H319	Calculation method

**References** : Not available.

✔ Indicates information that has changed from previously issued version.

### Notice to reader

**Disclaimer:** The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.