

# SAFETY DATA SHEET



PfuUltra High-Fidelity DNA Polymerase, Part Number 600382

## Section 1. Identification

**Product identifier** : PfuUltra High-Fidelity DNA Polymerase, Part Number 600382  
**Part No. (Chemical Kit)** : 600382  
**Part No.** : PfuUltra HF DNA Polymerase 600380-51  
 10X PfuUltra HF Reaction Buffer 600380-52

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

Analytical reagent.

PfuUltra HF DNA Polymerase 40 µl (100 U 2.5 U/µl)  
 10X PfuUltra HF Reaction Buffer 2 x 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

10X PfuUltra HF Reaction Buffer  
 H319

SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A

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

### GHS label elements

#### Hazard pictograms

: 10X PfuUltra HF Reaction Buffer



#### Signal word

: PfuUltra HF DNA Polymerase No signal word.  
 10X PfuUltra HF Reaction Buffer WARNING

#### Hazard statements

: PfuUltra HF DNA Polymerase No known significant effects or critical hazards.  
 10X PfuUltra HF Reaction Buffer H319 - Causes serious eye irritation.

### Precautionary statements

## Section 2. Hazard(s) identification

<b>Prevention</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not applicable. P280 - Wear eye or face protection. P264 - Wash hands thoroughly after handling.
<b>Response</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction 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>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not applicable. Not applicable.
<b>Disposal</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not applicable. Not applicable.
<b>Supplemental label elements</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not applicable. Not applicable.
<b>Other hazards which do not result in classification</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	None known. None known.

## Section 3. Composition and ingredient information

<b>Substance/mixture</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Mixture Mixture
--------------------------	---	--------------------

### CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
PfuUltra HF DNA Polymerase Glycerol	≥30 - ≤60	56-81-5
10X PfuUltra HF Reaction 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>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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
--------------------	---	---

## Section 4. First aid measures

<b>Inhalation</b>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction Buffer	to rinse for at least 10 minutes. Get medical attention. 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. 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>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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.
<b><u>Most important symptoms/effects, acute and delayed</u></b>		
<b><u>Potential acute health effects</u></b>		
<b>Eye contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.  Causes serious eye irritation.
<b>Inhalation</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.  No known significant effects or critical hazards.

## Section 4. First aid measures

<b>Skin contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b><u>Over-exposure signs/symptoms</u></b>		
<b>Eye contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. Adverse symptoms may include the following:  pain or irritation watering redness
<b>Inhalation</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.
<b>Skin contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.
<b>Ingestion</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.

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

<b>Notes to physician</b>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction Buffer	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>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific treatment. No specific treatment.
<b>Protection of first-aiders</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction 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.

See toxicological information (Section 11)

## Section 5. Firefighting measures

### Extinguishing media

<b>Suitable extinguishing media</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
-------------------------------------	---	--

## Section 5. Firefighting measures

<b>Unsuitable extinguishing media</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	None known.  None known.
<b>Specific hazards arising from the chemical</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction 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.
<b>Hazardous thermal decomposition products</b>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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
<b>Special protective actions for fire-fighters</b>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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. 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.
<b>Special protective equipment for fire-fighters</b>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. 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>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction Buffer	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment. 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>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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". 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".

## Section 6. Accidental release measures

<b>Environmental precautions</b>	: PfuUltra HF DNA Polymerase	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	10X PfuUltra HF Reaction 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>	: PfuUltra HF DNA Polymerase	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	10X PfuUltra HF Reaction 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>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	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 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>	: PfuUltra HF DNA Polymerase  10X PfuUltra HF Reaction 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. 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>	: PfuUltra HF DNA Polymerase	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
---	------------------------------	---

## Section 7. Handling and storage

10X PfuUltra HF Reaction Buffer

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. 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
PfuUltra HF DNA Polymerase 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.

**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: chemical splash goggles.

### 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. 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.

## Section 8. Exposure controls and personal protection

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

## Section 9. Physical and chemical properties

### Appearance

<b>Physical state</b>	: PfuUltra HF DNA Polymerase	Liquid.
	10X PfuUltra HF Reaction Buffer	Liquid.
<b>Colour</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>Odour</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>Odour threshold</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>pH</b>	: PfuUltra HF DNA Polymerase	8.2
	10X PfuUltra HF Reaction Buffer	8.8
<b>Melting point</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	0°C (32°F)
<b>Boiling point</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	100°C (212°F)
<b>Flash point</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>Evaporation rate</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>Flammability (solid, gas)</b>	: PfuUltra HF DNA Polymerase	Not applicable.
	10X PfuUltra HF Reaction Buffer	Not applicable.
<b>Lower and upper explosive (flammable) limits</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>Vapour pressure</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.
<b>Vapour density</b>	: PfuUltra HF DNA Polymerase	Not available.
	10X PfuUltra HF Reaction Buffer	Not available.



## Section 9. Physical and chemical properties

<b>Relative density</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not available. Not available.
<b>Solubility</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	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>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not available. Not available.
<b>Auto-ignition temperature</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not available. Not available.
<b>Decomposition temperature</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not available. Not available.
<b>Viscosity</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	Not available. Not available.

## Section 10. Stability and reactivity

<b>Reactivity</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction 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.
<b>Chemical stability</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	The product is stable. The product is stable.
<b>Possibility of hazardous reactions</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction 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.
<b>Conditions to avoid</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.
<b>Incompatible materials</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials.
<b>Hazardous decomposition products</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction 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.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>PfuUltra HF DNA Polymerase</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
<b>10X PfuUltra HF Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	LD50 Oral	Rat	1800 mg/kg	-

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>PfuUltra HF DNA Polymerase</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>10X PfuUltra HF Reaction Buffer</b> 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** : PfuUltra HF DNA Polymerase Routes of entry anticipated: Oral, Dermal, Inhalation.  
10X PfuUltra HF Reaction Buffer Routes of entry anticipated: Oral, Dermal, Inhalation.

#### Potential acute health effects

## Section 11. Toxicological information

<b>Eye contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards. Causes serious eye irritation.
<b>Inhalation</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	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>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. Adverse symptoms may include the following: pain or irritation watering redness
<b>Inhalation</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.
<b>Skin contact</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.
<b>Ingestion</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No specific data. No specific data.

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

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

Not available.

<b>General</b>	: PfuUltra HF DNA Polymerase 10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
----------------	---	--

## Section 11. Toxicological information

<b>Carcinogenicity</b>	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.
<b>Mutagenicity</b>	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.
<b>Teratogenicity</b>	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.
<b>Developmental effects</b>	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.
<b>Fertility effects</b>	: PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra HF Reaction Buffer	No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
10X PfuUltra HF Reaction Buffer Oral	180000 mg/kg

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
PfuUltra HF DNA Polymerase Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
10X PfuUltra HF Reaction 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

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
10X PfuUltra HF Reaction Buffer Polyoxyethylene octyl phenyl ether	-	-	Readily

### Bioaccumulative potential

## Section 12. Ecological information

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
PfuUltra HF DNA Polymerase Glycerol	-1.76	-	low
10X PfuUltra HF Reaction 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. 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 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.

## Section 15. Regulatory information

### [Rotterdam Convention on Prior Informed Consent \(PIC\)](#)

Not listed.

### [UNECE Aarhus Protocol on POPs and Heavy Metals](#)

Not listed.

### [Inventory list](#)

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

## Section 16. Any other relevant information

### [History](#)

<a href="#">Date of issue/Date of revision</a>	: 21/06/2017
<a href="#">Date of previous issue</a>	: 28/10/2015.
<a href="#">Version</a>	: 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
<input checked="" type="checkbox"/> 10X PfuUltra HF Reaction 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.