

SAFETY DATA SHEET

PfuUltra II Fusion HS DNA Polymerase, Part Number 600672

Section 1. Identification

Product identifier	: PfuUltra II Fusion HS DNA Polymerase, Part Number 600672
Part no. (chemical kit)	: 600672
Part no.	: PfuUltra II Fusion HS DNA Polymerase 600672-51 10X PfuUltra II Reaction Buffer 600670-52
Material uses	: Analytical reagent. PfuUltra II Fusion HS DNA Polymerase 0.2 ml (200 reactions) 10X PfuUltra II Reaction Buffer 2 x 1 ml
Supplier/Manufacturer	: Agilent Technologies, Inc. 5301 Stevens Creek Blvd Santa Clara, CA 95051, USA 800-227-9770
Emergency telephone number (with hours of operation)	: CHEMTREC®: 1-800-424-9300

Section 2. Hazard identification

Classification of the substance or mixture

PfuUltra II Fusion HS DNA Polymerase H320	EYE IRRITATION - Category 2B
10X PfuUltra II Reaction Buffer H319	EYE IRRITATION - Category 2A

GHS label elements

Hazard pictograms

: 10X PfuUltra II Reaction Buffer



Signal word

: PfuUltra II Fusion HS DNA Polymerase Warning
10X PfuUltra II Reaction Buffer Warning

Hazard statements

: PfuUltra II Fusion HS DNA Polymerase H320 - Causes eye irritation.
10X PfuUltra II Reaction Buffer H319 - Causes serious eye irritation.

Precautionary statements

Prevention

: PfuUltra II Fusion HS DNA Polymerase Not applicable.
10X PfuUltra II Reaction Buffer P280 - Wear eye or face protection.

Section 2. Hazard identification

Response	: PfuUltra II Fusion HS DNA Polymerase	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 PfuUltra II Reaction Buffer	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.
Storage	: PfuUltra II Fusion HS DNA Polymerase	Not applicable.
	10X PfuUltra II Reaction Buffer	Not applicable.
Disposal	: PfuUltra II Fusion HS DNA Polymerase	Not applicable.
	10X PfuUltra II Reaction Buffer	Not applicable.
Supplemental label elements	: PfuUltra II Fusion HS DNA Polymerase	None known.
	10X PfuUltra II Reaction Buffer	None known.
	10X PfuUltra II Reaction Buffer	Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 3.4%
Other hazards which do not result in classification	: PfuUltra II Fusion HS DNA Polymerase	None known.
	10X PfuUltra II Reaction Buffer	None known.

Section 3. Composition/information on ingredients

Substance/mixture	: PfuUltra II Fusion HS DNA Polymerase	Mixture
	10X PfuUltra II Reaction Buffer	Mixture

Ingredient name	% (w/w)	CAS number
PfuUltra II Fusion HS DNA Polymerase		
Glycerol	30 - 60	56-81-5
10X PfuUltra II Reaction Buffer		
Trometamol	1 - 5	77-86-1
Ammonium sulphate	0.1 - 1	7783-20-2
Polyoxyethylene octyl phenyl ether	0.1 - 1	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

Section 4. First-aid measures

Eye contact	: PfuUltra II Fusion HS DNA Polymerase	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 PfuUltra II Reaction Buffer	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.
Inhalation	: PfuUltra II Fusion HS DNA Polymerase	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 PfuUltra II Reaction Buffer	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.
Skin contact	: PfuUltra II Fusion HS DNA Polymerase	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 PfuUltra II Reaction Buffer	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.
Ingestion	: PfuUltra II Fusion HS DNA Polymerase	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 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.
	10X PfuUltra II Reaction Buffer	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed

Section 4. First-aid measures

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

Eye contact	: PfuUltra II Fusion HS DNA Polymerase	Causes eye irritation.
	10X PfuUltra II Reaction Buffer	Causes serious eye irritation.
Inhalation	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards.
Skin contact	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards.
Ingestion	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	: PfuUltra II Fusion HS DNA Polymerase	Adverse symptoms may include the following: irritation watering redness
	10X PfuUltra II Reaction Buffer	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	: PfuUltra II Fusion HS DNA Polymerase	No specific data.
	10X PfuUltra II Reaction Buffer	No specific data.
Skin contact	: PfuUltra II Fusion HS DNA Polymerase	No specific data.
	10X PfuUltra II Reaction Buffer	No specific data.
Ingestion	: PfuUltra II Fusion HS DNA Polymerase	No specific data.
	10X PfuUltra II Reaction Buffer	No specific data.

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

Section 4. First-aid measures

Notes to physician	: PfuUltra II Fusion HS DNA Polymerase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	10X PfuUltra II Reaction Buffer	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	: PfuUltra II Fusion HS DNA Polymerase	No specific treatment.
	10X PfuUltra II Reaction Buffer	No specific treatment.
Protection of first-aiders	: PfuUltra II Fusion HS DNA Polymerase	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	10X PfuUltra II Reaction 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. Fire-fighting measures

Extinguishing media

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

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters	: PfuUltra II Fusion HS DNA Polymerase	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	10X PfuUltra II 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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: PfuUltra II Fusion HS DNA Polymerase	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 PfuUltra II 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: PfuUltra II Fusion HS DNA Polymerase	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".
	10X PfuUltra II Reaction Buffer	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".
Environmental precautions	: PfuUltra II Fusion HS DNA Polymerase	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).
	10X PfuUltra II Reaction Buffer	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).

Methods and materials for containment and cleaning up

Methods for cleaning up	: PfuUltra II Fusion HS 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 II 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

Section 6. Accidental release measures

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

Protective measures

: PfuUltra II Fusion HS DNA Polymerase

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.

10X PfuUltra II Reaction Buffer

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.

Advice on general occupational hygiene

: PfuUltra II Fusion HS DNA Polymerase

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

10X PfuUltra II 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.

Conditions for safe storage, including any incompatibilities

: PfuUltra II Fusion HS 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 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.

10X PfuUltra II Reaction 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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for

Section 7. Handling and storage

incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

[Control parameters](#)

[Occupational exposure limits](#)

Ingredient name	Exposure limits
PfuUltra II Fusion HS DNA Polymerase Glycerol	CA Alberta Provincial (Canada, 6/2018). 8 hrs OEL: 10 mg/m ³ 8 hours. Form: Mist CA Quebec Provincial (Canada, 7/2019). TWAEV: 10 mg/m ³ 8 hours. Form: mist CA Saskatchewan Provincial (Canada, 7/2013). STEL: 20 mg/m ³ 15 minutes. Form: mist TWA: 10 mg/m ³ 8 hours. Form: mist CA British Columbia Provincial (Canada, 1/2021). TWA: 3 mg/m ³ 8 hours. Form: respirable mist TWA: 10 mg/m ³ 8 hours. Form: total mist

[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.

Section 8. Exposure controls/personal protection

- 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

- Physical state** : PfuUltra II Fusion HS DNA Polymerase Liquid.
10X PfuUltra II Reaction Buffer Liquid.
- Color** : PfuUltra II Fusion HS DNA Polymerase Not available.
10X PfuUltra II Reaction Buffer Not available.
- Odor** : PfuUltra II Fusion HS DNA Polymerase Not available.
10X PfuUltra II Reaction Buffer Not available.
- Odor threshold** : PfuUltra II Fusion HS DNA Polymerase Not available.
10X PfuUltra II Reaction Buffer Not available.
- pH** : PfuUltra II Fusion HS DNA Polymerase 8
10X PfuUltra II Reaction Buffer 10
- Melting point/freezing point** : PfuUltra II Fusion HS DNA Polymerase Not available.
10X PfuUltra II Reaction Buffer Not available.
- Boiling point, initial boiling point, and boiling range** : PfuUltra II Fusion HS DNA Polymerase Not available.
10X PfuUltra II Reaction Buffer Not available.

Flash point	Ingredient name	Closed cup			Open cup		
		°C	°F	Method	°C	°F	Method
	PfuUltra II Fusion HS DNA Polymerase						
	Edetic acid	>100	>212	DIN 51758			
	Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	>109.85	>229.7				
	10X PfuUltra II Reaction Buffer						
	Polyoxyethylene octyl	>109.85	>229.7				

Section 9. Physical and chemical properties and safety characteristics

		phenyl ether																																																												
Evaporation rate	:	PfuUltra II Fusion HS DNA Polymerase	Not available.																																																											
		10X PfuUltra II Reaction Buffer	Not available.																																																											
Flammability	:	PfuUltra II Fusion HS DNA Polymerase	Not applicable.																																																											
		10X PfuUltra II Reaction Buffer	Not applicable.																																																											
Lower and upper explosion limit/flammability limit	:	PfuUltra II Fusion HS DNA Polymerase	Not available.																																																											
		10X PfuUltra II Reaction Buffer	Not available.																																																											
Vapor pressure	:	<table><tr><th rowspan="2">Ingredient name</th><th colspan="3">Vapor Pressure at 20°C</th><th colspan="3">Vapor pressure at 50°C</th></tr><tr><th>mm Hg</th><th>kPa</th><th>Method</th><th>mm Hg</th><th>kPa</th><th>Method</th></tr><tr><td> PfuUltra II Fusion HS DNA Polymerase</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Water</td><td>23.8</td><td>3.2</td><td></td><td>92.258</td><td>12.3</td><td></td></tr><tr><td>2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride</td><td>0.000027</td><td>0.0000036</td><td></td><td>0.000007501</td><td>0.000001</td><td></td></tr><tr><td>10X PfuUltra II Reaction Buffer</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Water</td><td>23.8</td><td>3.2</td><td></td><td>92.258</td><td>12.3</td><td></td></tr><tr><td>Polyoxyethylene octyl phenyl ether</td><td><1</td><td><0.13</td><td></td><td></td><td></td><td></td></tr></table>						Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C			mm Hg	kPa	Method	mm Hg	kPa	Method	 PfuUltra II Fusion HS DNA Polymerase							Water	23.8	3.2		92.258	12.3		2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	0.000027	0.0000036		0.000007501	0.000001		10X PfuUltra II Reaction Buffer							Water	23.8	3.2		92.258	12.3		Polyoxyethylene octyl phenyl ether	<1	<0.13				
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Relative vapor density	:	PfuUltra II Fusion HS DNA Polymerase	Not available.																																																											
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		10X PfuUltra II Reaction Buffer	Not available.																																																											
Solubility	:	PfuUltra II Fusion HS DNA Polymerase	Soluble in the following materials: cold water and hot water.																																																											
		10X PfuUltra II Reaction Buffer	Easily soluble in the following materials: cold water and hot water.																																																											
Partition coefficient: n-octanol/water	:	 PfuUltra II Fusion HS DNA Polymerase	Not applicable.																																																											
		10X PfuUltra II Reaction Buffer	Not applicable.																																																											
Auto-ignition temperature	:	<table><tr><th>Ingredient name</th><th>°C</th><th>°F</th><th>Method</th></tr><tr><td> PfuUltra II Fusion HS DNA Polymerase</td><td></td><td></td><td></td></tr><tr><td>Glycerol</td><td>370</td><td>698</td><td></td></tr><tr><td>Edetic acid</td><td>>400</td><td>>752</td><td>VDI 2263</td></tr></table>					Ingredient name	°C	°F	Method	 PfuUltra II Fusion HS DNA Polymerase				Glycerol	370	698		Edetic acid	>400	>752	VDI 2263																																								
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Edetic acid	>400	>752	VDI 2263																																																											

Section 9. Physical and chemical properties and safety characteristics

Decomposition temperature	PfuUltra II Fusion HS DNA Polymerase	Not available.
	10X PfuUltra II Reaction Buffer	Not available.
Viscosity	PfuUltra II Fusion HS DNA Polymerase	Not available.
	10X PfuUltra II Reaction Buffer	Not available.
<u>Particle characteristics</u>		
Median particle size	PfuUltra II Fusion HS DNA Polymerase	Not applicable.
	10X PfuUltra II Reaction Buffer	Not applicable.

Section 10. Stability and reactivity

Reactivity	PfuUltra II Fusion HS DNA Polymerase	No specific test data related to reactivity available for this product or its ingredients.
	10X PfuUltra II Reaction Buffer	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	PfuUltra II Fusion HS DNA Polymerase	The product is stable.
	10X PfuUltra II Reaction Buffer	The product is stable.
Possibility of hazardous reactions	PfuUltra II Fusion HS DNA Polymerase	Under normal conditions of storage and use, hazardous reactions will not occur.
	10X PfuUltra II Reaction Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	PfuUltra II Fusion HS DNA Polymerase	No specific data.
	10X PfuUltra II Reaction Buffer	No specific data.
Incompatible materials	PfuUltra II Fusion HS DNA Polymerase	May react or be incompatible with oxidizing materials.
	10X PfuUltra II Reaction Buffer	May react or be incompatible with oxidizing materials.
Hazardous decomposition products	PfuUltra II Fusion HS DNA Polymerase	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	10X PfuUltra II Reaction 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
PfuUltra II Fusion HS DNA Polymerase Glycerol	LD50 Oral	Rat	12600 mg/kg	-
10X PfuUltra II Reaction Buffer Trometamol	LD50 Dermal	Rat	>5000 mg/kg	-
Ammonium sulphate	LD50 Oral	Rat	2840 mg/kg	-
Polyoxyethylene octyl phenyl ether	LD50 Oral	Rat	1800 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
PfuUltra II Fusion HS DNA Polymerase Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
10X PfuUltra II Reaction Buffer Trometamol	Skin - Moderate irritant	Rabbit	-	25 %	-
	Skin - Severe irritant	Rabbit	-	500 mg	-
Polyoxyethylene octyl phenyl ether	Skin - Mild irritant	Rabbit	-	24 hours 500 uL	-

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)

Name	Category	Route of exposure	Target organs
10X PfuUltra II Reaction Buffer Trometamol	Category 3	-	Respiratory tract irritation
Polyoxyethylene octyl phenyl ether	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Section 11. Toxicological information

Not available.

Information on the likely routes of exposure : PfuUltra II Fusion HS DNA Polymerase Routes of entry anticipated: Oral, Dermal, Inhalation.
10X PfuUltra II Reaction Buffer Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : PfuUltra II Fusion HS DNA Polymerase Causes eye irritation.
10X PfuUltra II Reaction Buffer Causes serious eye irritation.

Inhalation : PfuUltra II Fusion HS DNA Polymerase No known significant effects or critical hazards.
10X PfuUltra II Reaction Buffer No known significant effects or critical hazards.

Skin contact : PfuUltra II Fusion HS DNA Polymerase No known significant effects or critical hazards.
10X PfuUltra II Reaction Buffer No known significant effects or critical hazards.

Ingestion : PfuUltra II Fusion HS DNA Polymerase No known significant effects or critical hazards.
10X PfuUltra II Reaction Buffer No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : PfuUltra II Fusion HS DNA Polymerase Adverse symptoms may include the following:
irritation
watering
redness
10X PfuUltra II Reaction Buffer Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : PfuUltra II Fusion HS DNA Polymerase No specific data.
10X PfuUltra II Reaction Buffer No specific data.

Skin contact : PfuUltra II Fusion HS DNA Polymerase No specific data.
10X PfuUltra II Reaction Buffer No specific data.

Ingestion : PfuUltra II Fusion HS DNA Polymerase No specific data.
10X PfuUltra II Reaction Buffer No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Section 11. Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards.
Carcinogenicity	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards.
Mutagenicity	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards.
Reproductive toxicity	: PfuUltra II Fusion HS DNA Polymerase	No known significant effects or critical hazards.
	10X PfuUltra II Reaction 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)
PfuUltra II Fusion HS DNA Polymerase					
Glycerol	12600	N/A	N/A	N/A	N/A
10X PfuUltra II Reaction Buffer					
10X PfuUltra II Reaction Buffer	110172.4	N/A	N/A	N/A	N/A
Ammonium sulphate	2840	N/A	N/A	N/A	N/A
Polyoxyethylene octyl phenyl ether	1800	N/A	N/A	N/A	N/A

Section 12. Ecological information


Toxicity


Product/ingredient name	Result	Species	Exposure
PfuUltra II Fusion HS DNA Polymerase	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Glycerol			
10X PfuUltra II Reaction Buffer			
Trometamol	Acute EC50 >980 mg/l Fresh water	Daphnia	48 hours
	Acute NOEC 520 mg/l Fresh water	Daphnia	48 hours
Ammonium sulphate	Chronic NOEC 7.5 mg/l Marine water	Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours
		Crustaceans - Ceriodaphnia rigaudi - Neonate	48 hours
Polyoxyethylene octyl phenyl ether	Acute LC50 5.85 mg/l Fresh water	Daphnia - Daphnia magna -	48 hours
	Acute LC50 11.2 mg/l Fresh water		

Section 12. Ecological information

	Acute LC50 4500 µg/l Fresh water	Neonate Fish - Pimephales promelas	96 hours
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Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
 PfuUltra II Fusion HS DNA Polymerase Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
10X PfuUltra II Reaction Buffer Trometamol	OECD 301F Ready Biodegradability - Manometric Respirometry Test	97.1 % - Readily - 28 days	30 mg/l	-

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

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
PfuUltra II Fusion HS DNA Polymerase Glycerol	-1.76	-	low
10X PfuUltra II Reaction Buffer Trometamol Ammonium sulphate Polyoxyethylene octyl phenyl ether	-2.31 -5.1 4.86	- - -	low low high

Mobility in soil

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

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

Section 13. Disposal considerations

- Disposal methods** : The generation of waste should be avoided or 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.

Section 14. Transport information

- TDG / 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

Canadian lists

- Canadian NPRI** : None of the components are listed.
- CEPA Toxic substances** : None of the components are listed.

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** : Not determined.
- Canada** : Not determined.
- China** : Not determined.
- Europe** : All components are listed or exempted.
- Japan** : **Japan inventory (CSCL):** Not determined.
Japan inventory (ISHL): Not determined.
- New Zealand** : Not determined.
- Philippines** : Not determined.
- Republic of Korea** : Not determined.

Section 15. Regulatory information


Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
United States	:  All components are active or exempted.
Viet Nam	: Not determined.

Section 16. Other information

History

Date of issue/Date of revision	: 02/02/2022
Date of previous issue	: 07/23/2019
Version	: 7
Key to abbreviations	: ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals HPR = Hazardous Products Regulations 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

Procedure used to derive the classification

Classification	Justification
 PfuUltra II Fusion HS DNA Polymerase EYE IRRITATION - Category 2B	Calculation method
10X PfuUltra II Reaction Buffer EYE IRRITATION - Category 2A	Calculation method

References : Not available.

 Indicates information that has changed from previously issued version.

Notice to reader

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