

SAFETY DATA SHEET



PfuUltra II Fusion HS DNA Polymerase, Part Number 930674

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : PfuUltra II Fusion HS DNA Polymerase, Part Number 930674
Part no. (chemical kit) : 930674
Part no. : PfuUltra II Fusion HS DNA Polymerase 930674-51
 10X PfuUltra II Reaction Buffer 930674-52

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

Identified uses : Analytical reagent.
 PfuUltra II Fusion HS DNA Polymerase 3 x 1.67 ml
 10X PfuUltra II Reaction Buffer 5 x 10 ml
Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies LDA UK Ltd.
 5500 Lakeside Cheadle Royal Business Park,
 Cheadle, Cheshire, SK8 3GR
 United Kingdom
 Tel: +44 (0) 345 712 5292
e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : PfuUltra II Fusion HS Mixture
 DNA Polymerase
 10X PfuUltra II Reaction Mixture
 Buffer

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

10X PfuUltra II Reaction Buffer

H319 SERIOUS EYE DAMAGE/EYE IRRITATION Category 2
 H412 LONG-TERM (CHRONIC) AQUATIC HAZARD Category 3

PfuUltra II Fusion HS DNA Polymerase The product is not classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

10X PfuUltra II Reaction Buffer The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

Ingredients of unknown toxicity : PfuUltra II Fusion HS DNA Polymerase Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 30 - 60%
 10X PfuUltra II Reaction Buffer Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10%
 Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%
 Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 1 - 10%

SECTION 2: Hazards identification

Ingredients of unknown ecotoxicity : 10X PfuUltra II Reaction Buffer Contains 3.4% of components with unknown hazards to the aquatic environment

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms : 10X PfuUltra II Reaction Buffer



Signal word : PfuUltra II Fusion HS DNA Polymerase No signal word.
10X PfuUltra II Reaction Buffer Warning

Hazard statements : PfuUltra II Fusion HS DNA Polymerase No known significant effects or critical hazards.
10X PfuUltra II Reaction Buffer H319 - Causes serious eye irritation.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention : PfuUltra II Fusion HS DNA Polymerase Not applicable.
10X PfuUltra II Reaction Buffer P280 - Wear eye or face protection.
P273 - Avoid release to the environment.

Response : PfuUltra II Fusion HS DNA Polymerase Not applicable.
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 P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : PfuUltra II Fusion HS DNA Polymerase Safety data sheet available on request.
10X PfuUltra II Reaction Buffer Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : PfuUltra II Fusion HS DNA Polymerase Not applicable.
10X PfuUltra II Reaction Buffer Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : PfuUltra II Fusion HS DNA Polymerase Not applicable.
10X PfuUltra II Reaction Buffer Not applicable.

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SECTION 2: Hazards identification

Tactile warning of danger : PfuUltra II Fusion HS DNA Polymerase Not applicable.
 10X PfuUltra II Reaction Buffer Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : PfuUltra II Fusion HS DNA Polymerase This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
 10X PfuUltra II Reaction Buffer This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification : PfuUltra II Fusion HS DNA Polymerase None known.
 10X PfuUltra II Reaction Buffer None known.

Substances identified as having endocrine disruptor properties	Ingredient name	Impact
	10X PfuUltra II Reaction Buffer Polyoxyethylene octyl phenyl ether	Environment

SECTION 3: Composition/information on ingredients

3.1 Substances : PfuUltra II Fusion HS DNA Polymerase Mixture
 10X PfuUltra II Reaction Buffer Mixture

Product/ingredient name	Identifiers	%	Classification	Type
PfuUltra II Fusion HS DNA Polymerase	UK (GB) REACH #: Annex V REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[1]
Glycerol				
10X PfuUltra II Reaction Buffer	EC: 201-064-4 CAS: 77-86-1	≤3	Skin Irrit. 2, H315 Eye Irrit. 2, H319	[1]
Trometamol	CAS: 9002-93-1	<2.5	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410 (M=1)	[1] [2]
Polyoxyethylene octyl phenyl ether			See Section 16 for the full text of the H statements declared above.	

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type
 PfuUltra II Fusion HS DNA Polymerase [1] Substance with a workplace exposure limit
 10X PfuUltra II Reaction Buffer [1] Substance classified with a health or environmental hazard
 [2] Substance of equivalent concern

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: PfuUltra II Fusion HS DNA Polymerase 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. 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.
Inhalation	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction 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. 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 10X PfuUltra II 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.
Ingestion	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur. 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.
Protection of first-aiders	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

SECTION 4: First aid measures

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

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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.
Specific treatments	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	No specific treatment. No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	None known. None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous combustion products	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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 sulfur oxides

SECTION 5: Firefighting measures

metal oxide/oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters	: PfuUltra II Fusion HS DNA Polymerase 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. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	: PfuUltra II Fusion HS DNA Polymerase 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. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: PfuUltra II Fusion HS DNA Polymerase 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 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.
For emergency responders	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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".

6.2 Environmental precautions

: PfuUltra II Fusion HS 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 II 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). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and material 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 inert dry material and place in an appropriate waste disposal container. May be

SECTION 6: Accidental release measures

harmful to the environment if released. Dispose of spillages under controlled conditions.

- 6.4 Reference to other sections** : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Protective measures** : PfuUltra II Fusion HS DNA Polymerase Put on appropriate personal protective equipment (see Section 8).
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 vapour or mist. Avoid release to the environment. 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.

7.2 Conditions for safe storage, including any incompatibilities

- Storage** : 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 unlabelled 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

- Recommendations** : PfuUltra II Fusion HS DNA Polymerase Industrial applications, Professional applications.
10X PfuUltra II Reaction Buffer Industrial applications, Professional applications.

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SECTION 7: Handling and storage

Industrial sector specific solutions : PfuUltra II Fusion HS DNA Polymerase Not available.
 10X PfuUltra II Reaction Buffer Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
PfuUltra II Fusion HS DNA Polymerase Glycerol	EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 10 mg/m ³ 8 hours. Form: Mist

Biological exposure indices

No exposure indices known.

Recommended monitoring procedures : Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
10X PfuUltra II Reaction Buffer Trometamol	DNEL	Long term Oral	8.3 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	29 mg/m ³	General population	Systemic
	DNEL	Long term Dermal	83.3 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	117.5 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	166.7 mg/kg bw/day	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

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

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. 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.

SECTION 8: Exposure controls/personal protection

- 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.
- 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.

SECTION 9: Physical and chemical properties

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Liquid. Liquid.
Colour	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Odour	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Odour threshold	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Melting point/freezing point	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Initial boiling point and boiling range	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Flammability	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not applicable. Not applicable.
Upper/lower flammability or explosive limits	:	PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Flash point	:		

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SECTION 9: Physical and chemical properties

Ingredient name	Closed cup		Open cup	
	°C	Method	°C	Method
PfuUltra II Fusion HS DNA Polymerase				
glycerol	-	-	177	-
10X PfuUltra II Reaction Buffer				
Polyoxyethylene octyl phenyl ether	>109.85	-	-	-

Auto-ignition temperature :

Ingredient name	°C	Method
PfuUltra II Fusion HS DNA Polymerase		
glycerol	370	-

Decomposition temperature :

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

Viscosity :

PfuUltra II Fusion HS DNA Polymerase	Not available.
10X PfuUltra II Reaction Buffer	Not available.

Solubility(ies) :

Media	Result
PfuUltra II Fusion HS DNA Polymerase water	Soluble
10X PfuUltra II Reaction Buffer water	Soluble

Partition coefficient: n-octanol/water :

PfuUltra II Fusion HS DNA Polymerase	Not applicable.
10X PfuUltra II Reaction Buffer	Not applicable.

Vapour pressure :

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
PfuUltra II Fusion HS DNA Polymerase						
water	17.5	2.3	-	92.258	12.3	-
glycerol	0.000075	0.00001	-	0.0025	0.00033	-
10X PfuUltra II Reaction Buffer						
water	17.5	2.3	-	92.258	12.3	-
Polyoxyethylene octyl phenyl ether	0.997581	0.13	-	-	-	-

SECTION 9: Physical and chemical properties

Evaporation rate	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Relative density	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Vapour density	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Explosive properties	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Oxidising properties	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not available. Not available.
Particle characteristics		
Median particle size	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	Not applicable. Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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.
10.2 Chemical stability	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	The product is stable. The product is stable.
10.3 Possibility of hazardous reactions	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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.
10.4 Conditions to avoid	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	No specific data. No specific data.
10.5 Incompatible materials	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II 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

11.1 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	-
Polyoxyethylene octyl phenyl ether	LD50 Oral	Rat	1800 mg/kg	-

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (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	180000.0	N/A	N/A	N/A	N/A
Polyoxyethylene octyl phenyl ether	1800	N/A	N/A	N/A	N/A

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	Rabbit	-	24 hours 500 uL	-

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

SECTION 11: Toxicological information

Not available.

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

Potential acute health effects

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.

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.

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.

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

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : 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.

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

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

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

Conclusion/Summary : Not available.

SECTION 11: Toxicological information

General	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
Carcinogenicity	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
Mutagenicity	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.
Reproductive toxicity	: PfuUltra II Fusion HS DNA Polymerase 10X PfuUltra II Reaction Buffer	No known significant effects or critical hazards. No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
PfuUltra II Fusion HS DNA Polymerase Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Trout - <i>Oncorhynchus mykiss</i>	96 hours
10X PfuUltra II Reaction Buffer Trometamol Polyoxyethylene octyl phenyl ether	Acute EC50 >980 mg/l Fresh water	Daphnia	48 hours
	Acute NOEC 520 mg/l Fresh water	Daphnia	48 hours
	Acute LC50 5.85 mg/l Fresh water	Crustaceans - Water flea - <i>Ceriodaphnia rigaudi</i> - Neonate	48 hours
	Acute LC50 11.2 mg/l Fresh water	Daphnia - Water flea - <i>Daphnia magna</i> - Neonate	48 hours
	Acute LC50 4500 µg/l Fresh water	Fish - Fathead minnow - <i>Pimephales promelas</i>	96 hours
	Chronic NOEC 0.004 mg/l Fresh water	Fish - Eastern mosquitofish - <i>Gambusia holbrooki</i>	28 days

Conclusion/Summary : Not available.

12.2 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	-

Conclusion/Summary : Not available.

SECTION 12: Ecological information

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

12.3 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 Polyoxyethylene octyl phenyl ether	-2.31 4.86	- -	Low High

12.4 Mobility in soil

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

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

- Methods of disposal** : 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.
- Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

Packaging

- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
- Special precautions** : Dispose of material(s) and residues under controlled conditions. 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

	ADR/RID	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-
14.5 Environmental hazards	No.	No.	No.

Additional information

14.6 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.

14.7 Transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture UK (GB)/REACH

Annex XIV - List of substances subject to authorisation

Annex XIV

Intrinsic property	Ingredient name	Status	Reference number	Date of revision
10X PfuUltra II Reaction Buffer Substance of equivalent concern for environment	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated covering well-defined substances and UVCB substances, polymers and homologues	Listed	42	1/1/2021

Substances of very high concern

Intrinsic property	Ingredient name	Status	Reference number	Date of revision
10X PfuUltra II Reaction Buffer Substance of equivalent concern for environment	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated covering well-defined substances and UVCB substances, polymers and homologues	Candidate	-	12/19/2012

Ozone depleting substances

Not listed.

Prior Informed Consent (PIC)

Not listed.

SECTION 15: Regulatory information

Persistent Organic Pollutants

Not listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Product / Ingredient name	Identifiers	Status
10X PfuUltra II Reaction Buffer 10X PfuUltra II Reaction Buffer		3

Label : PfuUltra II Fusion HS DNA Polymerase
10X PfuUltra II Reaction Buffer Not applicable.

Seveso Directive

This product is not controlled under the Seveso Directive.

EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Not listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

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

United States : All components are active or exempted.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms

: ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DMEL = Derived Minimal Effect Level
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 N/A = Not available
 PBT = Persistent, Bioaccumulative and Toxic
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number
 vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification

PfuUltra II Fusion HS DNA Polymerase, Part Number 930674

SECTION 16: Other information

Classification	Justification
10X PfuUltra II Reaction Buffer Eye Irrit. 2, H319 Aquatic Chronic 3, H412	Calculation method Calculation method

Full text of abbreviated H statements

10X PfuUltra II Reaction Buffer	
H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Full text of classifications

10X PfuUltra II Reaction Buffer	
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Acute 1	SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
Aquatic Chronic 1	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2

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Version : 5

Notice to reader

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