SAFETY DATA SHEET

Agilent Technologies

PfuUltra High-Fidelity DNA Polymerase AD, Part Number 600385

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

1.1 Product identifier

Product name : PfuUltra High-Fidelity DNA Polymerase AD, Part Number 600385

Part no. (chemical kit) : 600385

Part no. :

PfuUltra DNA Polymerase AD	600385-51
10X PfuUltra Reaction Buffer AD	600385-52

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

Material uses : Analytical reagent.

PfuUltra DNA Polymerase AD	0.04 ml (100 U 2.5 U/µl)
10X PfuUltra Reaction Buffer AD	1 ml

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Manufacturing GmbH & Co. KG
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000

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 DNA Polymerase AD	Mixture
10X PfuUltra Reaction Buffer AD	Mixture

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

Not classified.

Ingredients of unknown toxicity : PfuUltra DNA Polymerase AD
10X PfuUltra Reaction Buffer AD

Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 30 - 60%
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: 1 - 10%

Ingredients of unknown ecotoxicity : 10X PfuUltra Reaction Buffer AD

Contains 2% 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

SECTION 2: Hazards identification

Signal word	:	PfuUltra DNA Polymerase AD	No signal word.
		10X PfuUltra Reaction Buffer AD	No signal word.
Hazard statements	:	PfuUltra DNA Polymerase AD	No known significant effects or critical hazards.
		10X PfuUltra Reaction Buffer AD	No known significant effects or critical hazards.

Precautionary statements

Prevention	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Not applicable.
Response	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Not applicable.
Storage	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Not applicable.
Disposal	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Not applicable.
Hazardous ingredients	:	10X PfuUltra Reaction Buffer AD	Not applicable.
Supplemental label elements	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Safety data sheet available on request.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Not applicable.

Special packaging requirements

Tactile warning of danger	:	PfuUltra DNA Polymerase AD	Not applicable.
		10X PfuUltra Reaction Buffer AD	Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	:	PfuUltra DNA Polymerase AD	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
		10X PfuUltra Reaction Buffer AD	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 DNA Polymerase AD	None known.
		10X PfuUltra Reaction Buffer AD	None known.

SECTION 3: Composition/information on ingredients

3.1 Substances : PfuUltra DNA Polymerase AD — Mixture
10X PfuUltra Reaction Buffer AD — Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
PfuUltra DNA Polymerase AD				
Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[2]
10X PfuUltra Reaction Buffer AD				
Dodecyldimethyl (3-sulphonatopropyl)ammonium	EC: 239-002-3 CAS: 14933-08-5	≤3	Acute Tox. 4, H302 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
Ammonium sulphate	EC: 231-984-1 CAS: 7783-20-2	≤3	Eye Irrit. 2, H319 **See Section 16 for the full text of the H statements declared above.**	[1]

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

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern
[6] Additional disclosure due to company policy

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 DNA Polymerase AD — 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.

10X PfuUltra Reaction Buffer AD — 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.

Inhalation : PfuUltra DNA Polymerase AD — Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

10X PfuUltra Reaction Buffer AD — Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : PfuUltra DNA Polymerase AD — Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

10X PfuUltra Reaction Buffer AD — Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

SECTION 4: First aid measures

Ingestion	:	PfuUltra DNA Polymerase AD	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.
		10X PfuUltra Reaction Buffer AD	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.
Protection of first-aiders	:	PfuUltra DNA Polymerase AD	No action shall be taken involving any personal risk or without suitable training.
		10X PfuUltra Reaction Buffer AD	No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	:	PfuUltra DNA Polymerase AD	No known significant effects or critical hazards.
		10X PfuUltra Reaction Buffer AD	No known significant effects or critical hazards.
Inhalation	:	PfuUltra DNA Polymerase AD	No known significant effects or critical hazards.
		10X PfuUltra Reaction Buffer AD	No known significant effects or critical hazards.
Skin contact	:	PfuUltra DNA Polymerase AD	No known significant effects or critical hazards.
		10X PfuUltra Reaction Buffer AD	No known significant effects or critical hazards.
Ingestion	:	PfuUltra DNA Polymerase AD	No known significant effects or critical hazards.
		10X PfuUltra Reaction Buffer AD	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	:	PfuUltra DNA Polymerase AD	No specific data.
		10X PfuUltra Reaction Buffer AD	No specific data.
Inhalation	:	PfuUltra DNA Polymerase AD	No specific data.
		10X PfuUltra Reaction Buffer AD	No specific data.
Skin contact	:	PfuUltra DNA Polymerase AD	No specific data.
		10X PfuUltra Reaction Buffer AD	No specific data.
Ingestion	:	PfuUltra DNA Polymerase AD	No specific data.
		10X PfuUltra Reaction Buffer AD	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	:	PfuUltra DNA Polymerase AD 10X PfuUltra Reaction Buffer AD	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.

SECTION 4: First aid measures

Specific treatments	:	PfuUltra DNA Polymerase AD	No specific treatment.
		10X PfuUltra Reaction Buffer AD	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	:	PfuUltra DNA Polymerase AD	In a fire or if heated, a pressure increase will occur and the container may burst.
		10X PfuUltra Reaction Buffer AD	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous combustion products	:	PfuUltra DNA Polymerase AD	Decomposition products may include the following materials: carbon dioxide carbon monoxide
		10X PfuUltra Reaction Buffer AD	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds

5.3 Advice for firefighters

Special precautions for fire-fighters	:	PfuUltra DNA Polymerase AD	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 Reaction Buffer AD	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 DNA Polymerase AD	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
		10X PfuUltra Reaction Buffer AD	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	PfuUltra DNA Polymerase AD	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.
		10X PfuUltra Reaction Buffer AD	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.
For emergency responders	:	PfuUltra DNA Polymerase AD	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".
		10X PfuUltra Reaction Buffer AD	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 DNA Polymerase AD	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 Reaction Buffer AD	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).

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	PfuUltra DNA Polymerase AD	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 Reaction Buffer AD	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.

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 DNA Polymerase AD	Put on appropriate personal protective equipment (see Section 8).
		10X PfuUltra Reaction Buffer AD	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	:	PfuUltra DNA Polymerase AD	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 Reaction Buffer AD	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.

SECTION 7: Handling and storage

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 DNA Polymerase AD	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 Reaction Buffer AD	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 DNA Polymerase AD	Industrial applications, Professional applications.
		10X PfuUltra Reaction Buffer AD	Industrial applications, Professional applications.
Industrial sector specific solutions	:	PfuUltra DNA Polymerase AD	Not available.
		10X PfuUltra Reaction Buffer AD	Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
PfuUltra DNA Polymerase AD Glycerol	**NAOSH (Ireland, 1/2020).** OELV-8hr: 10 mg/m³ 8 hours. Form: mist

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

SECTION 8: Exposure controls/personal protection

Product/ingredient name	Type	Exposure	Value	Population	Effects
10X PfuUltra Reaction Buffer AD					
Ammonium sulphate	DNEL	Long term Inhalation	1.667 mg/m³	General population	Systemic
	DNEL	Long term Oral	6.4 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	11.167 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	12.8 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	42.667 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.

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

SECTION 9: Physical and chemical properties

Physical state : PfuUltra DNA Polymerase AD — Liquid.
10X PfuUltra Reaction Buffer AD — Liquid.

Colour : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

Odour : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

Odour threshold : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

Melting point/freezing point : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

Initial boiling point and boiling range : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

Flammability (solid, gas) : PfuUltra DNA Polymerase AD — Not applicable.
10X PfuUltra Reaction Buffer AD — Not applicable.

Upper/lower flammability or explosive limits : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

Flash point :

Ingredient name	Closed cup °C	Closed cup °F	Closed cup Method	Open cup °C	Open cup °F	Open cup Method
PfuUltra DNA Polymerase AD						
Edetic acid	>100	>212	DIN 51758			
(R*,R*) -1,4-Dimercaptobutane-2,3-diol	>110	>230				

Auto-ignition temperature :

Ingredient name	°C	°F	Method
PfuUltra DNA Polymerase AD			
Glycerol	370	698	
Edetic acid	>400	>752	VDI 2263

Decomposition temperature : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

pH : PfuUltra DNA Polymerase AD — 8.2
10X PfuUltra Reaction Buffer AD — 8.8

Viscosity : PfuUltra DNA Polymerase AD — Not available.
10X PfuUltra Reaction Buffer AD — Not available.

SECTION 9: Physical and chemical properties

Solubility(ies) :

PfuUltra DNA Polymerase AD	Soluble in the following materials: cold water and hot water.
10X PfuUltra Reaction Buffer AD	Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water :

PfuUltra DNA Polymerase AD	Not applicable.
10X PfuUltra Reaction Buffer AD	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 DNA Polymerase AD						
water	23.8	3.2		92.258	12.3	
Glycerol	0.000075	0.00001		0.0025	0.00033	
10X PfuUltra Reaction Buffer AD						
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	

Evaporation rate :

PfuUltra DNA Polymerase AD	Not available.
10X PfuUltra Reaction Buffer AD	Not available.

Relative density :

PfuUltra DNA Polymerase AD	Not available.
10X PfuUltra Reaction Buffer AD	Not available.

Vapour density :

PfuUltra DNA Polymerase AD	Not available.
10X PfuUltra Reaction Buffer AD	Not available.

Oxidising properties :

PfuUltra DNA Polymerase AD	Not available.
10X PfuUltra Reaction Buffer AD	Not available.

Particle characteristics

Median particle size :

PfuUltra DNA Polymerase AD	Not applicable.
10X PfuUltra Reaction Buffer AD	Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity :

PfuUltra DNA Polymerase AD	No specific test data related to reactivity available for this product or its ingredients.
10X PfuUltra Reaction Buffer AD	No specific test data related to reactivity available for this product or its ingredients.

SECTION 10: Stability and reactivity

10.2 Chemical stability	:	PfuUltra DNA Polymerase AD	The product is stable.
		10X PfuUltra Reaction Buffer AD	The product is stable.
10.3 Possibility of hazardous reactions	:	PfuUltra DNA Polymerase AD	Under normal conditions of storage and use, hazardous reactions will not occur.
		10X PfuUltra Reaction Buffer AD	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:	PfuUltra DNA Polymerase AD	No specific data.
		10X PfuUltra Reaction Buffer AD	No specific data.
10.5 Incompatible materials	:	PfuUltra DNA Polymerase AD	May react or be incompatible with oxidising materials.
		10X PfuUltra Reaction Buffer AD	May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products	:	PfuUltra DNA Polymerase AD	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		10X PfuUltra Reaction Buffer AD	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
10X PfuUltra Reaction Buffer AD				
Ammonium sulphate	LD50 Oral	Rat	2840 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)
10X PfuUltra Reaction Buffer AD					
10X PfuUltra Reaction Buffer AD	25000	55000	N/A	550	N/A
Dodecyldimethyl(3-sulphonatopropyl)ammonium	500	1100	N/A	11	N/A
Ammonium sulphate	2840	N/A	N/A	N/A	N/A

Irritation/Corrosion

Conclusion/Summary : Not available.

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.

SECTION 11: Toxicological information

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
10X PfuUltra Reaction Buffer AD Dodecyldimethyl(3-sulphonatopropyl)ammonium	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure

: PfuUltra DNA Polymerase AD — Routes of entry anticipated: Oral, Dermal, Inhalation.

: 10X PfuUltra Reaction Buffer AD — Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Inhalation

: PfuUltra DNA Polymerase AD — No known significant effects or critical hazards.

: 10X PfuUltra Reaction Buffer AD — No known significant effects or critical hazards.

Ingestion

: PfuUltra DNA Polymerase AD — No known significant effects or critical hazards.

: 10X PfuUltra Reaction Buffer AD — No known significant effects or critical hazards.

Skin contact

: PfuUltra DNA Polymerase AD — No known significant effects or critical hazards.

: 10X PfuUltra Reaction Buffer AD — No known significant effects or critical hazards.

Eye contact

: PfuUltra DNA Polymerase AD — No known significant effects or critical hazards.

: 10X PfuUltra Reaction Buffer AD — No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation

: PfuUltra DNA Polymerase AD — No specific data.

: 10X PfuUltra Reaction Buffer AD — No specific data.

Ingestion

: PfuUltra DNA Polymerase AD — No specific data.

: 10X PfuUltra Reaction Buffer AD — No specific data.

Skin contact

: PfuUltra DNA Polymerase AD — No specific data.

: 10X PfuUltra Reaction Buffer AD — No specific data.

Eye contact

: PfuUltra DNA Polymerase AD — No specific data.

: 10X PfuUltra Reaction Buffer AD — 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

SECTION 11: Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

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

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
10X PfuUltra Reaction Buffer AD Ammonium sulphate	Chronic NOEC 7.5 mg/l Marine water	Algae - Phaeodactylum tricornutum - Exponential growth phase	96 hours

12.2 Persistence and degradability

Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
10X PfuUltra Reaction Buffer AD Ammonium sulphate	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
10X PfuUltra Reaction Buffer AD Ammonium sulphate	-5.1	-	low

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.

SECTION 12: Ecological information

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 : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 2008/98/EC.

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 : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

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

Ingredient name	EC number	CAS number	Restriction
10X PfuUltra Reaction Buffer AD ammonium sulphate	231-984-1	7783-20-2	65

Label : PfuUltra DNA Polymerase AD Not applicable.
10X PfuUltra Reaction Buffer AD Not applicable.

Other EU regulations

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

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 : Not determined.

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

New Zealand : Not determined.

Philippines : Not determined.

Republic of Korea : Not determined.

Taiwan : All components are listed or exempted.

SECTION 15: Regulatory information

Thailand : Not determined.

Turkey : Not determined.

United States : Not determined.

Viet Nam : Not determined.

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

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

Classification	Justification
Not classified.	

Full text of abbreviated H statements

10X PfuUltra Reaction Buffer AD	
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.

Full text of classifications [CLP/GHS]

10X PfuUltra Reaction Buffer AD	
Acute Tox. 4	ACUTE TOXICITY - Category 4
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

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Date of previous issue : No previous validation

Version : 1

Notice to reader

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